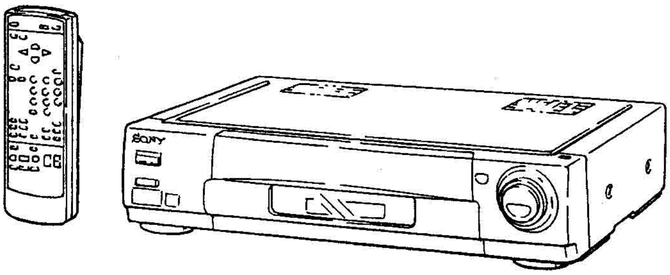
SLV-E40ES/E40IT/E40UX

RMT-V148J/V148K

SERVICE MANUAL

Spanish Model
SLV-E40ES
Italian Model
SLV-E40IT
UK Model
SLV-E40UX



- **Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENTS Ⅲ for MECHANICAL ADJUSTMENTS. (9-973-211-11)**

VHS

SPECIFICATIONS

System

Channel coverage
UX:
PAL (I):
UHF B21 – B69
ES, IT:
PAL:
VHF E2 – E12
(A-H, Italian model)
CATV S01 – S05, S1 – S20
HYPER S21 – S41
UHF E21 – E69

RF output signal
UHF channels 30 – 39

Aerial out
75-ohm asymmetrical aerial socket

Inputs and outputs

EURO-AV
PAY TV/CANAL + (ES, IT)
21-pin
Video input : pin 20
Audio input : pins 2 and 6
Video output : pin 19
Audio output : pins 1 and 3

General

Power requirements
220 – 240 V AC, 50 Hz

Power consumption
19 W

Operating temperature
5 °C to 40 °C

Storage temperature
– 20 °C to 60 °C

Dimensions
Approx. 430 × 100 × 378 mm (w/h/d) including projecting parts and controls

Mass
Approx. 5.1 kg

Supplied accessories

Remote commander RMT-V148J (SLV-E40UX)
Remote commander RMT-V148K (SLV-E40ES/E40IT)
R6 (size AA) batteries (2)
Aerial cable (1)
Mains lead (1)

Design and specifications are subject to change without notice.

MICROFILM

VIDEO CASSETTE RECORDER

SONY®

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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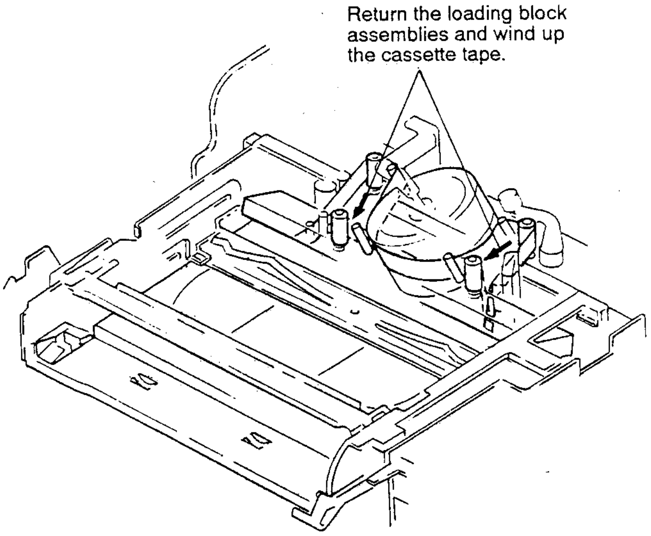
SERVICE NOTE

1. TAKING OUT CASSETTE WHEN THE UNIT IS DEFECTIVE WITH CASSETTE IN

1) Remove the upper case, the front panel assembly and the bottom plate.
2) Turn the loading pulley in the arrow Ⓐ direction and the clutch pulley in the arrow Ⓑ direction simultaneously to return the loading block assemblies and to wind up the cassette tape.


Return the loading block assemblies and wind up the cassette tape.

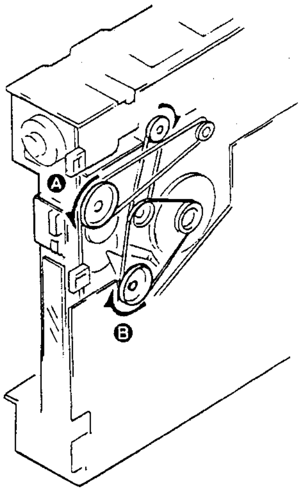


Fig. 1.

3) When the loading block assemblies reach the initial positions, the loading pulley stops turning.

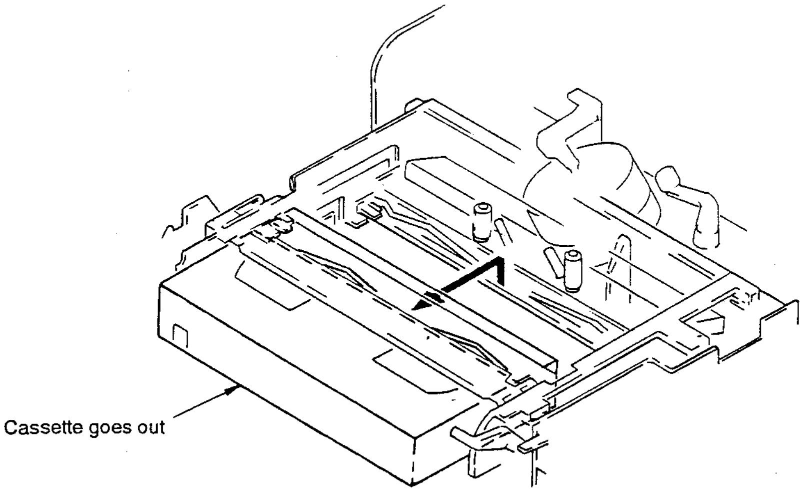

Cassette goes out

Fig. 2.

4) Keep turning the clutch pulley in the arrow Ⓑ direction the cassette goes out.

Note: When performing 1., be careful not to clog and damage the cassette tape.

2. UPPER DRUM REPLACEMENT

2-1. Removal of Upper Drum

1) Remove the screw = (2.6 × 3) and take out the SD ground assembly = . (See Fig. 3.)
2) Completely remove the rotary upper drum board and desolder the soldering indicated by the arrows.
3) Remove two screw = (PSW3 × 8) and take out the rotary upper drum in the arrow direction Ⓐ. (See Fig. 4.)
   If it difficult, remove by shaking the rotary upper drum gradually.

Note: If the drum can not be removed, check wheater the solders have been removed or not again.

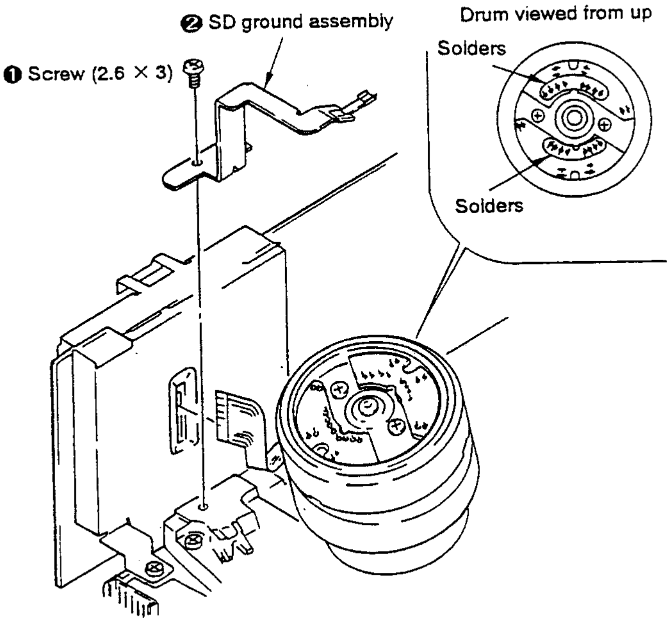


Fig. 3.

2-2. Mounting Upper Drum

1) When inserting the rotary drum into the lower drum, be careful not to blur the contacting surface with fingerprint or the like.
2) Mount the rotaly upper drum board by aligning marked ➡ with marked ⇛ of rotary transformer board (lower drum) so that the screw holes of both upper and lower drums match. (See Fig. 4.)
3) If it is difficult, mount the upper drum by shaking it gradually.
   Note: Be careful not to damage the head. Make sure that the upper drum is tightly inserted.
4) Tighten two screws = (PSW3 × 8). (See Fig. 4.)
   Note: Temporary tighten two screws. After making sure that upper drum is tightly inserted, tighten the screws.
5) Solder points on the board of the rotary upper drum.
6) Fix the SD ground assembly = using the screw = (2.6 × 3) so that the protrusin of SD ground assembly end contacts the center of the drum shaft.
   Note: When attaching the SD ground assembly = , be careful not to apply force to the spring section of it.

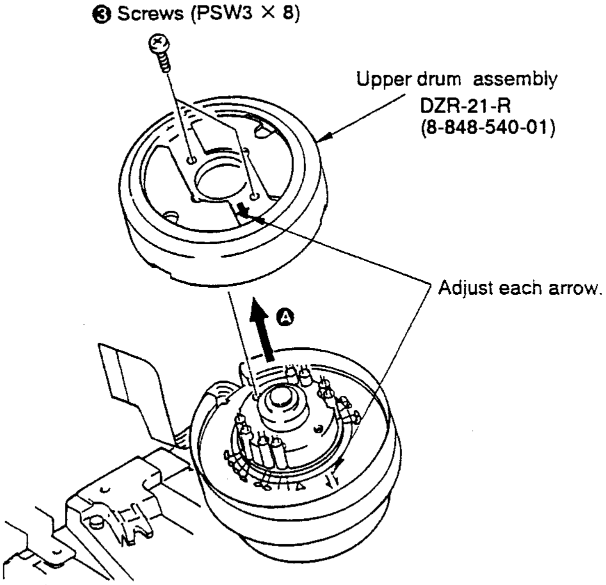
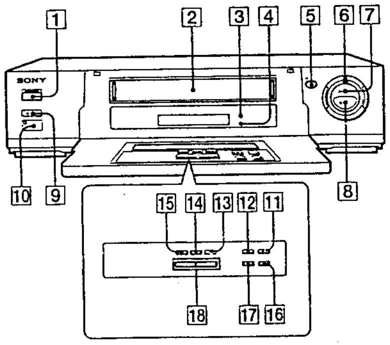


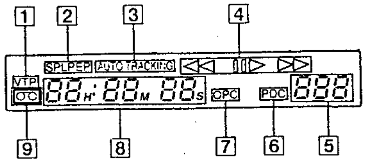
Fig. 4.

Index to parts and controls

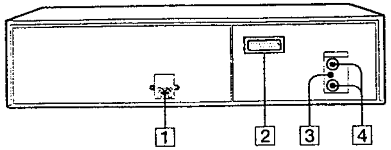
Refer to the pages indicated in ( ) for details.



1 ON/STANDBY switch/indicator
2 Tape compartment
3 TIMER REC (recording) indicator (23
4 REC (recording) indicator
5 II PAUSE button (34)
6 DUAL MODE SHUTTLE ring (31)
7 ▷ PLAY button (31)
8 ■ STOP button (34)
9 ≜ EJECT button
10 Remote sensor (5)
11 QUICK TIMER button
12 OPC button (32)
13 PDC button (25)
14 INPUT SELECT button (34)
15 TV/VTR button
16 ● REC (recording) button (34)
17 TIMER REC ON/OFF button
18 CHANNEL +/– buttons

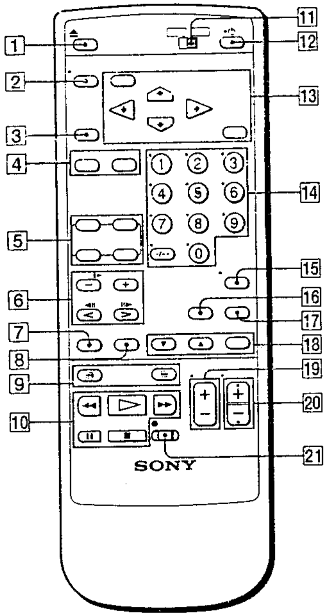


1 VTR indicator (21)
2 Tape speed indicators (19)
3 AUTO TRACKING indicator (32)
4 Tape operation indicators
5 Line/channel indicator (19)
6 PDC indicator (25)
7 OPC indicator (32)
8 Time counter/clock (13, 18)
9 Tape indicator



1 AC IN connector
2 EURO-AV (LINE) connector (7, 33)
3 RF CHANNEL 30 – 39 screw (9)
4 AERIAL IN/OUT connectors (7)

Remote commander



1 ≜ EJECT button (17)

2 TV/VTR button (21)

3 COUNTER RESET button (18)

4 TIMER REC (recording) buttons (23, 26)
   CLEAR button
   ON/OFF button

5 VIDEO Plus+ buttons (26)
   VIDEO Plus+ button
   ONCE button
   DAILY button
   WEEKLY button

6 I▶ SLOW and ◀II/II▶ FRAME buttons (30)

7 REPLAY button (30)

8 ×2 (30)

9 ⏪/⏩ SEARCH buttons (30)

10 Tape transport buttons
   ▷ PLAY button
   ■ STOP button
   ◀◀ REW/▶▶ FF buttons
   II PAUSE button

11 TV/VTR remote control switch (6)

12 ⏻ (on/standby) switch

13 Menu operation buttons
   MENU button
   CURSOR buttons (↑/↓/←/→)
   EXECUTE button

14 Programme number buttons and -/-- (ten's digit) button

15 DISPLAY button (18)

16 TAPE SPEED button (19)

17 INPUT SELECT button (34)

18 TRACKING buttons (32)
   ▼/▲ NORMAL/SLOW (STILL ADJUST) buttons
   AUTO/MANUAL button

19 VOL (volume) button

20 PROG (programme) buttons (8)

21 ● REC (recording) button (19)

SECTION 1
GENERAL

SLV-E40ES/E40IT/E40UX

This section is extracted from SLV-E40UX instruction manual.

Welcome!

Thank you for purchasing the Sony Video Cassette Recorder (VCR). Here are some of the features you'll enjoy with your VCR:

- Optimum Picture Control (OPC) that automatically optimises recording and playback performance
- Dual Mode Shuttle (DMS) ring for easy playback and search operations
- VIDEO Plus+* system that lets you quickly and easily preset the VCR to record programmes
- ON SCREEN HELP messages that warn that you have attempted an incorrect operation

* VIDEO Plus+ and Plus Code are trademarks of Gemstar Development Corporation. VIDEO Plus+ system is manufactured under license from Gemstar Development Corporation.

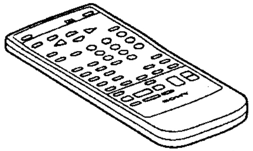
Compatible colour systems

This VCR is designed to record and playback using the PAL (I) colour system. Recording of video sources based on other colour systems cannot be guaranteed.

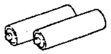
Step 1 Unpacking

Check that you have the following items:

- **Remote commander**

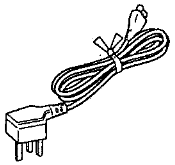


- **R6 (size AA) batteries**



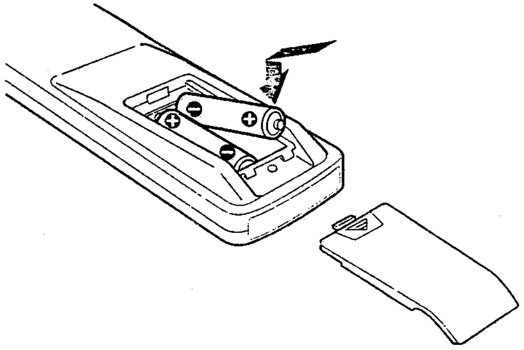
- **Aerial cable**

- **Mains lead**



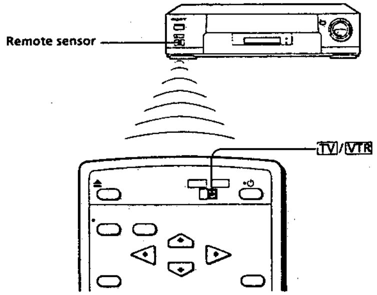
Step 2 Setting up the remote commander

Insert two R6 (size AA) batteries by matching the + and – on the batteries to the diagram inside the battery compartment.



Using the remote commander

You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your TV.

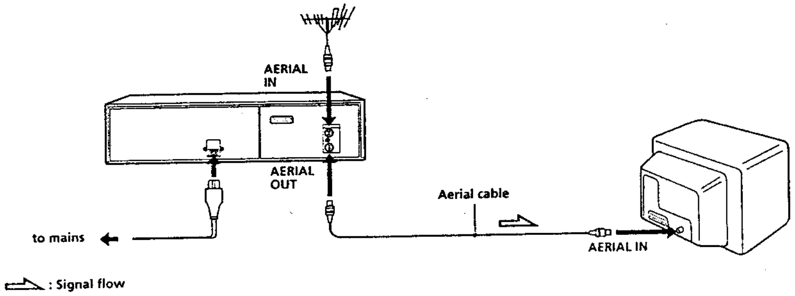


To operate	Set TV/VTR to
the VCR	VTR and point at the remote sensor on the VCR
a Sony TV	TV and point at the remote sensor on the TV

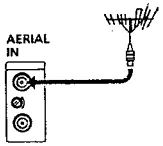
Notes

- With normal use, the batteries should last for approximately three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.

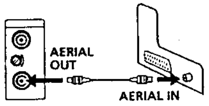
Step 3 Connecting the VCR



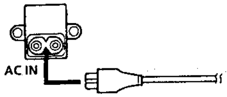
1 **Disconnect the aerial input cable from your TV and connect it to AERIAL IN of the VCR.**



2 **Connect AERIAL OUT of the VCR and the aerial input of your TV using the supplied aerial cable.**



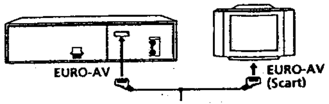
3 **Connect AC IN of the VCR and the mains supply using the supplied mains lead.**
You've completed the basic hookup to watch and record TV programmes.



Additional connections to a TV

If your TV has a EURO-AV (Scart) connector, this additional connection can improve picture quality.

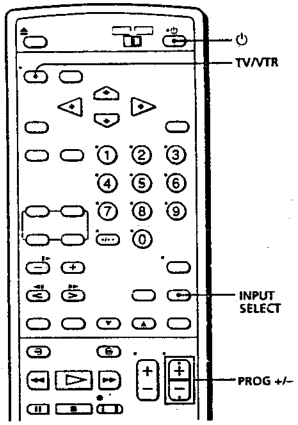
1. Connect to the TV as shown on the right.
2. Set RF MODULATOR to OFF.
   1) Press MENU.
   2) Press CURSOR (↑/↓) to select SET UP MENU, then press EXECUTE.
   3) Press CURSOR (←/→) to set RF MODULATOR to OFF.



VMC-2121 EURO-AV cable (not supplied)

Step 4 Tuning the TV to your VCR

If you have connected the VCR to your TV using the EURO-AV cable, skip this step.



1

Press ⏻ (on/standby) to turn on the VCR.

2

Press TV/VTR to light "VTR" in the display window.

3

INPUT SELECT

Press INPUT SELECT until "L" appears in the display window.

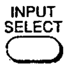
4

Turn on your TV and select a programme position for video playback.

5

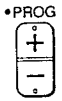
Tune the TV between UHF channels 30 and 39 so that a clear blue screen appears on the TV screen.
Refer to your TV manual for tuning instructions.

6



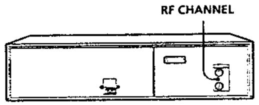
Press INPUT SELECT until "L" disappears and a programme number lights instead.

7



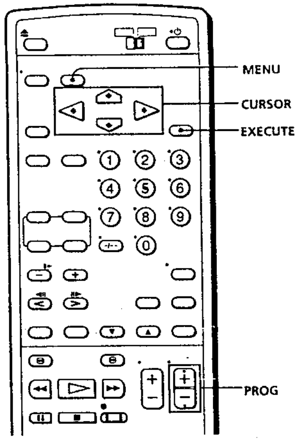
Press PROG +/– to check to see if the TV screen changes to a different programme.
You have now tuned your TV to the VCR. Whenever you play a tape, set the TV to the programme position selected in step **4** on the left page.

To obtain a clear blue screen
The blue screen may not appear clearly in step **5** on the page 8. In this case, turn the RF CHANNEL screw at the rear of the VCR with an RF screwdriver, to a position where the TV clearly displays a blue screen.



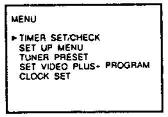
Step 5 Tuning the VCR to TV channels

Now you can set your VCR to receive broadcast channels using the on-screen display.



1 MENU

Press MENU.
The following menu appears on the TV screen.

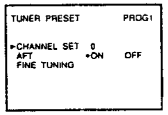


```
MENU

►TIMER SET/CHECK
 SET UP MENU
 TUNER PRESET
 SET VIDEO PLUS+ PROGRAM
 CLOCK SET
```

2 CURSOR EXECUTE

Press the CURSOR (↑/↓) buttons to move the cursor (▶) to TUNER PRESET, then press EXECUTE.

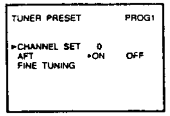


```
TUNER PRESET           PROG1

►CHANNEL SET   0
 AFT          •ON     OFF
 FINE TUNING
```

3 CURSOR

Press the CURSOR (↑/↓) buttons to move the cursor (▶) to CHANNEL SET.

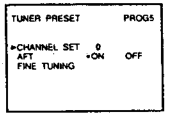


```
TUNER PRESET           PROG1

►CHANNEL SET   0
 AFT          •ON     OFF
 FINE TUNING
```

4 •PROG

Press PROG +/- to select the programme position.

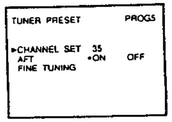


```
TUNER PRESET           PROG5

►CHANNEL SET   0
 AFT          •ON     OFF
 FINE TUNING
```

5 CURSOR

Press CURSOR → to start tuning.
The VCR starts searching for a channel and displays the first one it finds on the TV screen. Press the CURSOR (←/→) buttons repeatedly until the channel you want is displayed.



```
TUNER PRESET           PROG5

►CHANNEL SET   35
 AFT          •ON     OFF
 FINE TUNING
```

If you know the number of the channel you want, press the number buttons. For two-digit numbers, press the -/- - (ten's digit) button followed by the number buttons.

6

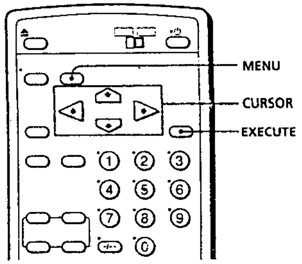
To allocate another channel to another programme position, repeat steps 4 and 5.

7 EXECUTE

Press EXECUTE to store all the allocated channels.

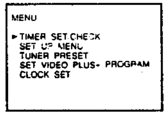
Step 6 Setting the clock

To record using the timer, you need to set the date and clock on the remote commander.



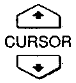
1

Press MENU.
The main MENU appears on the TV screen.

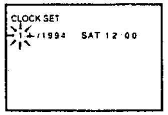


MENU
►TIMER SET CHECK
SET UP MENU
TUNER PRESET
SET VIDEO PLUS+ PROGRAM
CLOCK SET

2



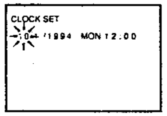
Press the CURSOR (↑/↓) buttons to move the cursor (►) to CLOCK SET, then press EXECUTE.
The CLOCK SET menu appears on the TV screen and the date flashes.



CLOCK SET
1 /1994 SAT 12:00

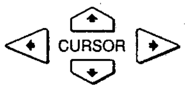
3

Set the date using the CURSOR (↑/↓) buttons.

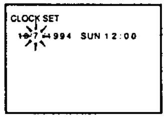


CLOCK SET
10 /1994 MON 12:00

4



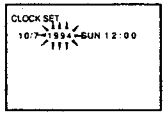
Press CURSOR → so that the month flashes and set the month using the CURSOR (↑/↓) buttons.



CLOCK SET
10/7 1994 SUN 12:00

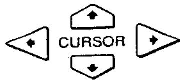
5

Press CURSOR → so that the year flashes and set the year using the CURSOR (↑/↓) buttons.
The day of the week is set automatically.

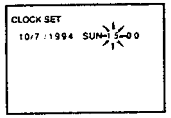


CLOCK SET
10/7 1994 SUN 12:00

6

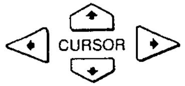


Press CURSOR → so that the hour flashes and set the hour using the CURSOR (↑/↓) buttons.

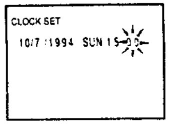


CLOCK SET
10/7 /1994 SUN 15 00

7



Press CURSOR → so that the minutes flash and set the minutes using the CURSOR (↑/↓) buttons.



CLOCK SET
10/7 /1994 SUN 15 00

8

Press EXECUTE to start the clock.
The VCR's display window shows the time set.

3:00

Step 7 Setting up VIDEO Plus+

VIDEO Plus+ is a feature in Sony VCRs that simplifies the task of programming the VCR to make timer recordings.

How VIDEO Plus+ works

Whenever you want to record a TV programme, all you need to do is look up the programme's "PlusCode," a number assigned to each programme that's published in TV guide magazines. Then, just enter the PlusCode of the programme you want and the VCR is automatically programmed to record that show. It's that simple. With VIDEO Plus+, you no longer have to go through a lengthy and often repetitive procedure when you set start and stop times, channel numbers, and dates. All this information is automatically sent to your VCR when you enter the programme's PlusCode.

How to set up your VCR

Before using VIDEO Plus+ to make timer recordings, you need to check whether the programme position number assigned to each TV channel matches those you have preset on the VCR.

The initial assigment is:

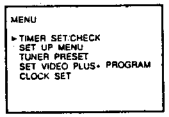
TV channel	BBC1	BBC2	ITV	CH4	CH5
Programme position	1	2	3	4	5

For example, if ITV is preset to progamme position 7 on your VCR, you need to change the initial assignment using the following procedure. For programme positions whose numbers are the same, you can skip this procedure.

1-7

1 MENU

Press MENU.
The main MENU appears on the TV screen.

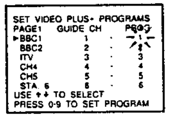


```
MENU

▶TIMER SET/CHECK
 SET UP MENU
 TUNER PRESET
 SET VIDEO PLUS+ PROGRAM
 CLOCK SET
```

2 CURSOR EXECUTE

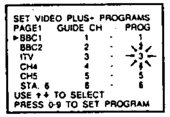
Press CURSOR ↑/↓ to move the cursor (▶) to SET VIDEO Plus+ PROGRAM, then press EXECUTE.
The SET VIDEO Plus+ PROGRAMS menu appears and the PROG column flashes.



```
SET VIDEO PLUS+ PROGRAMS
PAGE1   GUIDE CH     PROG
▶BBC1        1   -     1
 BBC2        2   -     2
 ITV         3   -     3
 CH4         4   -     4
 CH5         5   -     5
 STA. 6      6   -     6
USE ↑↓ TO SELECT
PRESS 0-9 TO SET PROGRAM
```

3 CURSOR

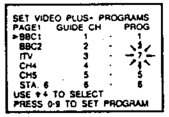
Press CURSOR ↑/↓ to move the cursor (▶) to the TV channel whose programme position number you want to change.



```
SET VIDEO PLUS+ PROGRAMS
PAGE1   GUIDE CH     PROG
▶BBC1        1   -     1
 BBC2        2   -     2
 ITV         3   -     3
 CH4         4   -     4
 CH5         5   -     5
 STA. 6      6   -     6
USE ↑↓ TO SELECT
PRESS 0-9 TO SET PROGRAM
```

4 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ -/-- ⓪

Enter the programme position number that you have preset on your VCR.
To change other initial settings, repeats steps 3 and 4.



```
SET VIDEO PLUS+ PROGRAMS
PAGE1   GUIDE CH     PROG
▶BBC1        1   -     1
 BBC2        2   -     2
 ITV         3   -     7
 CH4         4   -     4
 CH5         5   -     5
 STA. 6      6   -     6
USE ↑↓ TO SELECT
PRESS 0-9 TO SET PROGRAM
```

5 EXECUTE

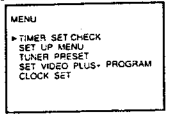
When you've finished, press EXECUTE to exit.

How to preset satellite channels

If you connect the VCR to a satellite tuner, you must preset the satellite channels to make timer settings for satellite programmes using VIDEO Plus+. Once you have made the settings, you don't need to modify them unless you change the VCR-satellite tuner connection. However, if you have connected more than one satellite tuner to the VCR via the AERIAL IN connector and EURO-AV (Scart) connector, you must change the settings each time you change the tuner on which you want to receive a satellite programme.

1 MENU

Press MENU.
The main MENU appears on the TV screen.

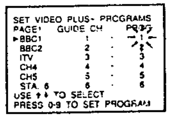


```
MENU

▶TIMER SET CHECK
 SET UP MENU
 TUNER PRESET
 SET VIDEO PLUS+ PROGRAM
 CLOCK SET
```

2 CURSOR EXECUTE

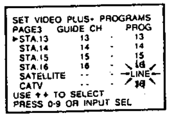
Press CURSOR ↑/↓ to move the cursor (▶) to SET VIDEO Plus+ PROGRAM, then press EXECUTE.
The SET VIDEO Plus+ PROGRAMS menu appears.



```
SET VIDEO PLUS+ PROGRAMS
PAGE1   GUIDE CH     PROG
▶BBC1        1   -     1
 BBC2        2   -     2
 ITV         3   -     3
 CH4         4   -     4
 CH5         5   -     5
 STA. 6      6   -     6
USE ↑↓ TO SELECT
PRESS 0-9 TO SET PROGRAM
```

3 CURSOR

Press CURSOR ↑/↓ to move the cursor (▶) to SATELLITE.
The SET VIDEO Plus+ PROGRAMS menu consists of three on-screen pages. Press and hold CURSOR ↓ to move the cursor (▶) to the third page.

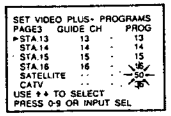


```
SET VIDEO PLUS+ PROGRAMS
PAGE3   GUIDE CH     PROG
▶STA.13     13   -    13
 STA.14     14   -    14
 STA.15     15   -    15
 STA.16     16   -    16
 SATELLITE  --   -   LINE
 CATV       --   -    18
USE ↑↓ TO SELECT
PRESS 0-9 OR INPUT SEL
```

4 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⓪ INPUT SELECT

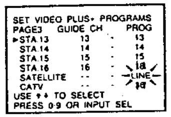
Enter the programme position number for satellite broadcasts:

- **If you have connected the satellite tuner via the AERIAL IN jack, enter the programme position number.**
  Use the number that is used for viewing satellite programmes on the VCR. (If you use programme position 50 to view satellite programmes on the VCR, enter "5" and then "0".)



```
SET VIDEO PLUS+ PROGRAMS
PAGE3   GUIDE CH     PROG
▶STA.13     13   -    13
 STA.14     14   -    14
 STA.15     15   -    15
 STA.16     16   -    16
 SATELLITE  --   -    50
 CATV       --   -    18
USE ↑↓ TO SELECT
PRESS 0-9 OR INPUT SEL
```

- **If you have connected the satellite tuner via the EURO-AV (Scart) connector, press INPUT SELECT.**
  "LINE" appears in the PROG column.



```
SET VIDEO PLUS+ PROGRAMS
PAGE3   GUIDE CH     PROG
▶STA.13     13   -    13
 STA.14     14   -    14
 STA.15     15   -    15
 STA.16     16   -    16
 SATELLITE  --   -   LINE
 CATV       --   -    18
USE ↑↓ TO SELECT
PRESS 0-9 OR INPUT SEL
```

5 EXECUTE

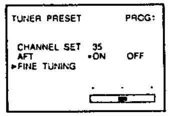
When you've finished, press EXECUTE to exit.

Additional tuning instructions

If the picture is not clear

Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture is not clear, you may also use the manual tuning function.

1 Press PROG +/– to select the programme number for which you cannot obtain a clear picture.
2 Press MENU, then select TUNER PRESET and press EXECUTE.
3 Select FINE TUNING. The fine tuning meter appears.



TUNER PRESET PROG:

CHANNEL SET 35
AFT •ON OFF
▸FINE TUNING

4 Press the CURSOR (←/→) buttons to get a clearer picture, then press EXECUTE. Note that the AFT (Auto Fine Tuning) setting switches to OFF.

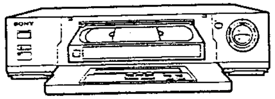
Disabling unwanted programme positions

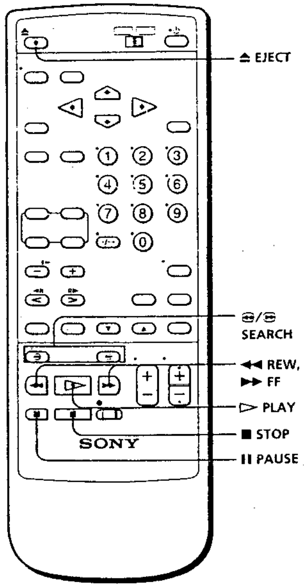
After tuning the TV channels, you can disable unused programme positions. Positions that are disabled will be skipped later when you press the PROG +/– buttons.

1 Press MENU, then select TUNER PRESET and press EXECUTE.
2 Press PROG +/– until the programme position you want to disable appears beside PROG.
3 Press number button "0" twice to display the number "0" beside CHANNEL SET.
4 Repeat steps **2** and **3** for other positions you want to disable.
5 Press EXECUTE.

Basic Operations

Playing a tape





Tips

- For further information on searching and playback functions, see "Playing/searching at various speeds" on page **30**.
- The display will not appear during still mode or slow-motion playback.

This section shows you how to play back a video tape.

1 Turn on your TV and tune in to the VCR:
- If the TV is connected to the VCR using the EURO-AV cable, set the TV to video input.
- If the TV is connected to the VCR using only the aerial cable, set the TV to the programme position for the VCR.

2 Open the drop down panel and insert a tape.
The VCR turns on automatically. The tape starts playing automatically if its safety tab has been removed.

3 Press ▷ PLAY to start playing.
When the tape reaches the end, the VCR automatically rewinds it to the beginning. (The power remains on.)

Additional tasks

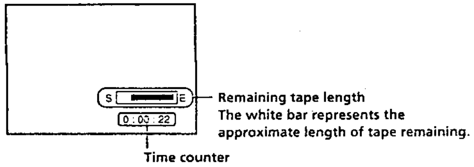
To	Press
Stop play	■ STOP
Pause play	II PAUSE
Resume play after pause	II PAUSE or ▷ PLAY
Search forward	⏩ SEARCH during playback
Search backward	⏪ SEARCH during playback
Fast-forward the tape	▶▶ FF during stop
Rewind the tape	◀◀ REW during stop
Eject the tape	≙ EJECT on the VCR

Playing a tape (continued)

Notes
- When a tape is reinserted, the counter returns to "0H00M00S."
- The counter will not work on tape portions with no recording.

Displaying the remaining tape length and time counter

Press DISPLAY to turn the display on or off.



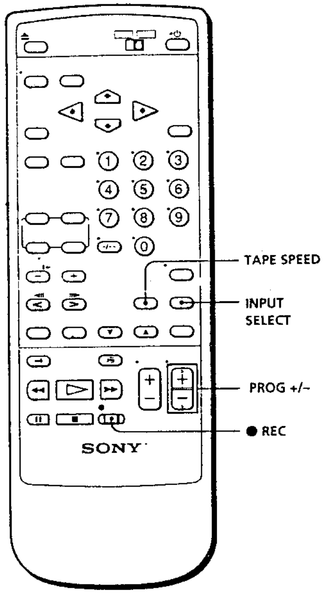
The white bar represents the approximate length of tape remaining.

Using the time counter

At the point on a tape that you want to find later, press COUNTER RESET to reset the counter to"0H00M00S" in the display window. When you rewind or advance the tape to this point, refer to the counter.

Recording TV programmes

This section shows you how to record TV programmes in the most basic way: manual recording. With manual recording, you start the VCR recording when the programme begins, then stop it when the programme ends. The VCR also provides the following ways of recording:
- Manually start recording, then stop it automatically—"Recording using the quick timer" (page 20)
- Automatically start and stop recording—"Recording TV programmes using the timer" (page 22)
- Automatically start and stop recording just by entering the "Plus Code"— "Recording TV programmes using VIDEO Plus+" (page 26)



1 **Turn on your TV and tune in to the VCR:**
- If the TV is connected to the VCR using the EURO-AV cable, set the TV to video input.
- If the TV is connected to the VCR using only the aerial cable, set the TV to the programme position for the VCR.

2 **Insert a tape with its safety tab in place.**

3 **Press INPUT SELECT until a programme position appears in the VCR's display window.**

4 **Select the desired programme position by pressing PROG +/–.**

5 **Select the tape speed, SP or LP, by pressing TAPE SPEED.**
See "To select tape speeds" on the next page.

6 **Start recording by pressing ● REC.**
When the tape reaches the end, the VCR automatically rewinds it to the beginning.

Note
- If you insert a tape with its safety tab removed, the VCR starts playing. To record on this tape, cover the tab hole.

Tip
- To select programme positions, you can also use the number buttons on the remote commander. For two-digit numbers, press the -/-- (ten's digit) button followed by the number buttons.

Recording TV programmes
(continued)

Tips
- To cut out an unwanted scene while recording, press II PAUSE, turn the DUAL MODE SHUTTLE ring on the VCR to rewind the tape to the beginning of the unwanted scene, then press II PAUSE to resume recording.
- The display appears on the TV screen indicating information about the tape, but the information will not be recorded on the tape.
- If you don't want to watch TV while recording, you can turn off the TV

Note
- If you've inserted a tape with its safety tab removed, the VCR ejects it when you press ● REC.

To stop recording
Press ■ STOP.

To select tape speeds
When recording, select either SP or LP. LP provides recording time twice as long as SP. However, SP provides better picture quality. You can mix SP and LP on the same tape. When playing back, the VCR automatically detects the tape speed. See the table below for the maximum recording/playback time in each speed.

Tape type	Maximum recording/playback time	
	SP	LP
E-240	4 hrs.	8 hrs.
E-180	3 hrs.	6 hrs.
E-120	2 hrs.	4 hrs.
E-60	1 hr.	2 hrs.

Recording using the quick timer

The quick timer enables you to record for a specified period of time in intervals of 30 minutes. Once you specify the recording time, the VCR automatically stops recording. Before you begin, check that the clock is set correctly.

After you start recording, press QUICK TIMER on the VCR until the desired duration appears in the display window. The TIMER REC indicator on the VCR lights up. Each press increases the recording duration in increments of 30 minutes as shown below.

→ 0:00 → 0:30 → 1:00 ----→ 8:30 → 9:00 ┐

The recording duration decreases minute by minute to 0:00, then the VCR turns off automatically.

To stop recording
To stop quick-timer recording while the VCR is recording a programme, press TIMER REC ON/OFF to turn off the TIMER REC indicator on the VCR.

To extend the recording duration while recording
Press QUICK TIMER on the VCR until the desired duration appears in the display window.

Watching a TV programme while recording another

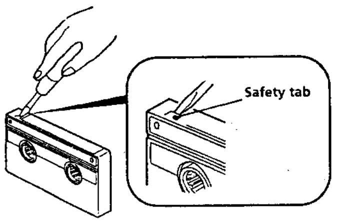
You can watch a TV programme and record another at the same time.

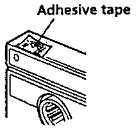
1 Press TV/VTR to turn off the VTR indicator in the display window.
2 If the TV is connected to the VCR using the EURO-AV cable, set the TV to TV input. If the TV is connected to the VCR using only the aerial cable, skip this step.
3 Select the desired programme position on the TV.

Saving a recording

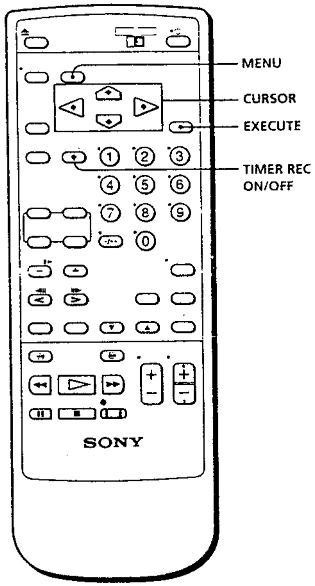
Video tapes have a safety tab to protect against accidental recording. To prevent accidental erasure of a recording, break off the safety tab with a screwdriver or other tool. A tape with its safety tab removed ejects if you try to record on it.

To record on a tape with its safety tab removed, cover the tab hole with adhesive tape.





Recording TV programmes using the timer


MENU
CURSOR
EXECUTE
TIMER REC ON/OFF
SONY

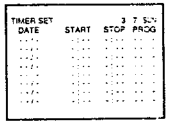
This section shows you how to let the VCR automatically start and stop recording TV programmes. You can preset up to eight programmes within a one month time frame. If VIDEO Plus+ is available in your area, see the section "Recording TV programmes using VIDEO Plus+"on page 26 for easier timer recording.

Before you start...

- Check that the clock is set correctly.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and tune in to the VCR.

1 Press MENU and select TIMER SET/ CHECK.

If the clock needs to be set, "PLEASE SET CLOCK" appears on the screen and the VCR automatically enters the clock setting mode.

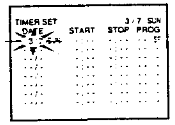

TIMER SET
3 7 SUN
DATE START STOP PROG

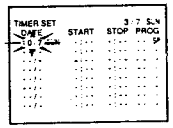
2 Set the date to start recording:

1 Press CURSOR ➡
Make sure today's date is flashing. If it isn't reset the clock to the correct time.

2 Press CURSOR ⬆ to set the date and month.
The day of the week is set automatically.

To record the same programme every day or the same day once a week, see "Daily/ weekly recording" on page 24.

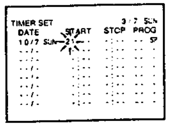

TIMER SET
3 7 SUN
DATE START STOP PROG

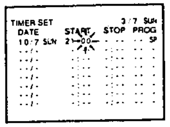

TIMER SET
3 7 SUN
DATE START STOP PROG

3 Set the time to start recording:

1 Press CURSOR ➡ to flash the hour under "START," then press the CURSOR (⬆/⬇) buttons to set the hour.

2 Press CURSOR ➡ to flash the minutes under "START," then press the CURSOR (⬆/⬇) buttons to set the minutes.


TIMER SET
3 7 SUN
DATE START STOP PROG
10/7 SUN


TIMER SET
3 7 SUN
DATE START STOP PROG
10/7 SUN

Tips

- To set the channel, you can also use the PROG +/– or number buttons.
- To record a video source from the EURO-AV connector, press INPUT SELECT to display "LINE" in the "PROG" position.

Tip

- To set the recording tape speed, you can also use TAPE SPEED.

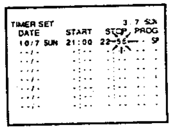
Tip

- To change or correct a setting before confirming it, press CURSOR ⬅ to flash the item you want to change and reset it.

Note

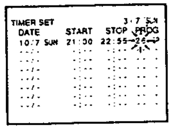
- If the power is interrupted for more than three hours while standing by for recording, timer settings are cleared.
Reset the settings from beginning.

4 Press CURSOR ➡, then set the time to stop recording in the same way.


TIMER SET
3 7 SUN
DATE START STOP PROG
10/7 SUN 21:00

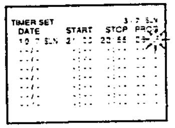
5 Press CURSOR ➡ , then press the CURSOR (⬆/⬇) buttons to select the programme position you want to record.

Only the programme positions preset in the VCR will appear.


TIMER SET
3 7 SUN
DATE START STOP PROG
10/7 SUN 21:00 22:55

6 Press CURSOR ➡ , then press the CURSOR (⬆/⬇) buttons to select the tape speed, SP or LP.

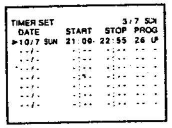
See "To select tape speeds" on page 20.


TIMER SET
DATE START STOP PROG

7 To confirm your programme press CURSOR ➡.

All the settings stop flashing and the cursor (▶) appears in the leftmost column.

To preset another timer setting, move the cursor to the next line using CURSOR ⬇ and repeat steps 2 to 7.


TIMER SET
3/7 SUN
DATE START STOP PROG
▶10/7 SUN 21:00 22:55 26 LP

8 After making the desired timer settings, press EXECUTE, then press TIMER REC ON/OFF.

The TIMER REC indicator on the VCR lights up and the VCR turns off and stands by for recording.

The VCR automatically turns on and starts recording at the preset start time, and turns off at the preset stop time.

To stop recording

To stop while the VCR is recording a programme, press TIMER REC ON/OFF to turn off the TIMER REC indicator on the VCR.

Recording TV programmes using the timer (continued)

To use the VCR while recording

You can do the following tasks during timer recording.

To	Press
Reset the counter to "0H00M00S"	COUNTER RESET
Display tape information on the TV screen	DISPLAY
Check the timer settings	MENU and select TIMER SET/CHECK
Watch another TV programme	TV/VTR (See "Watching a TV programme while recording another" on page **21**.)

Using the VCR before timer recording begins

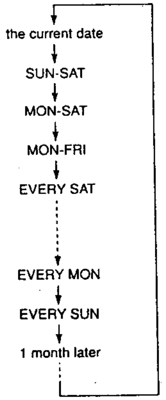
Press TIMER REC ON/OFF to turn off the TIMER REC indicator on the VCR, then press ⏻ (on/standby). The VCR is ready for use.

After using the VCR, press TIMER REC ON/OFF again to turn on the TIMER REC indicator on the VCR. Remember to reset the VCR to stand by for recording before the time you've set the VCR to start recording, or the timer setting will be cancelled.

Daily/weekly recording

Daily recording records the same programme every day of the week; weekly recording records the same programme on the same day, every week.

When you set the date to start recording in step **2** of "Recording TV programmes using the timer," press CURSOR ↓ until the desired day appears. Each time you press the button, the indication changes as shown on the left.



(cycles backward)

Notes

- If recording times overlap due to a PDC timer shift, the programme that was broadcast first has priority. The second programme will begin to record only when the first programme has finished.
- If the PDC signal is too weak or the broadcasting station failed to transmit PDC signals, the VCR will record the programme without using the PDC function even if the PDC indicator is lit in the display window.

Timer recording with PDC signals

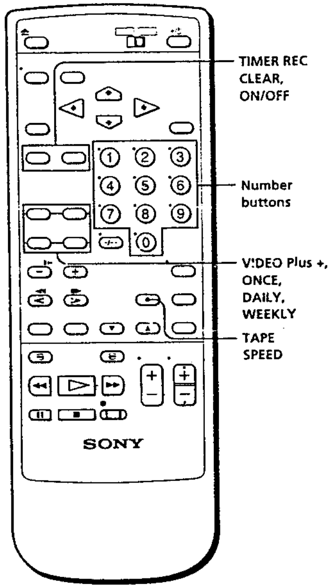
The broadcast system transmits PDC (Programme Delivery Control) signals with its TV programmes. These signals ensure that your timer recordings are made regardless of broadcast delays, early starts or broadcast interruptions. When setting the timer, make sure to enter the start and stop times exactly as indicated in the TV programme guide, otherwise the PDC function will not work.

1 If the TIMER REC indicator on the VCR is lit, press TIMER REC ON/OFF on the VCR to release the VCR from standby and turn off the indicator.

2 Press PDC on the VCR.
The PDC indicator lights up in the display window.

3 If you turned off the TIMER REC indicator in step **1**, press TIMER REC ON/OFF on the VCR.
The VCR returns to recording standby. Once you switch on the PDC function, it works on all timer settings that are set to programmes with PDC signals.

Recording TV programmes using VIDEO Plus+



Notes

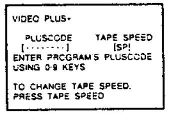
- You cannot set VIDEO Plus+ in the following cases:
  - When the VCR is turned off.
  - While recording using the timer or quick timer.
  - While the VCR stands by for timer recording.
- The timer will not accept settings in the following cases:
  - When you select DAILY for a Saturday and Sunday programme.
  - When you select DAILY or WEEKLY for a programme more than seven days ahead.
  - When you enter the PlusCode of a programme that has already ended.

This section shows you another way of timer recording: recording using VIDEO Plus+. This allows you to record TV programmes more easily. Just enter the programme's "PlusCode," and the VCR will automatically record the programme. You can preset up to eight programmes within a one month time frame.

Before you start...

- Check that the clock is set correctly.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and tune in to the VCR.

1 **Press VIDEO Plus+.**
If the clock needs to be set, "PLEASE SET CLOCK" appears on the screen and the VCR automatically enters the clock setting mode.

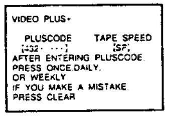


```
VIDEO PLUS+

  PLUSCODE      TAPE SPEED
 [·········]        [SP]
ENTER PROGRAM'S PLUSCODE
USING 0-9 KEYS

TO CHANGE TAPE SPEED.
PRESS TAPE SPEED
```

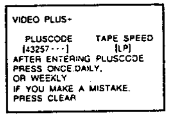
2 **Enter the desired programme's PlusCode using the number buttons.**
If you make a mistake, press TIMER REC CLEAR and enter the PlusCode again.



```
VIDEO PLUS+

  PLUSCODE      TAPE SPEED
 [432·  ···]        [SP]
AFTER ENTERING PLUSCODE.
PRESS ONCE.DAILY.
OR WEEKLY
IF YOU MAKE A MISTAKE.
PRESS CLEAR
```

3 **Select the tape speed, SP or LP, by pressing TAPE SPEED.**



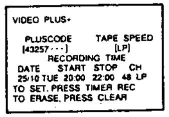
```
VIDEO PLUS+

  PLUSCODE      TAPE SPEED
 [43257···]         [LP]
AFTER ENTERING PLUSCODE
PRESS ONCE.DAILY.
OR WEEKLY
IF YOU MAKE A MISTAKE.
PRESS CLEAR
```

4 **Press ONCE, DAILY or WEEKLY according to the following:**

To record the programme	Press
Only once	ONCE
Monday to Friday at the same scheduled time	DAILY
Every week at the same scheduled time	WEEKLY

The recording information appears on the TV screen: date, programme start and stop times, channel number and tape speed.
Check that the information is correct.
To preset another timer setting, repeat steps **1** to **4**.



```
VIDEO PLUS+

  PLUSCODE      TAPE SPEED
 [43257···]         [LP]
        RECORDING TIME
 DATE     START  STOP   CH
 25/10 TUE 20:00  22:00  48 LP
TO SET. PRESS TIMER REC
TO ERASE. PRESS CLEAR
```

Notes

- If the power is interrupted for more than one hour while the VCR is standing by for recording, the timer settings are cleared. Reset the timer.

5 **Press TIMER REC ON/OFF.**
The TIMER REC indicator on the VCR lights up and the VCR stands by for recording.
The VCR automatically turns on, records the programme and turns off.

To record satellite broadcasts

1. Turn on the satellite tuner.
2. Select the programme you want to record, on the satellite tuner.
3. Follow the steps described above.
4. Keep the satellite tuner switched on until the VCR finishes recording the satellite programme.

To stop recording

To stop while the VCR is recording a programme, press TIMER REC ON/OFF to turn off the TIMER REC indicator on the VCR.

To use the VCR while recording

You can do the following tasks while recording using VIDEO Plus+.

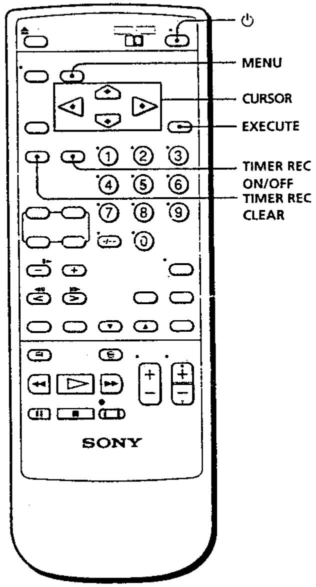
To	Press
Reset the counter to "0H00M00S"	COUNTER RESET
Display tape information on the TV screen	DISPLAY
Check the timer settings	MENU and select TIMER SET/CHECK
Watch another TV programme	TV/VTR (See "Watching a TV programme while recording another" on page **21**)

Using the VCR before recording begins

Press TIMER REC ON/OFF to turn off the TIMER REC indicator on the VCR, then press ⏻ (on/standby). The VCR is ready for use.

After using the VCR, press TIMER REC ON/OFF again to turn on the TIMER REC indicator on the VCR.
Remember to reset the VCR to stand by for recording before the time you've set the VCR to start recording, or the timer setting will be cancelled.

Checking/changing/ cancelling timer settings


⏻
MENU
CURSOR
EXECUTE
TIMER REC ON/OFF
TIMER REC CLEAR
SONY

This section shows you how to check, change and cancel the timer settings after you've stored them in the VCR.

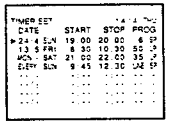
Before you start...

- Turn on your TV and tune in to the VCR.

1 Press TIMER REC ON/OFF to turn off the TIMER REC indicator on the VCR.

2 Press ⏻ (on/standby) to turn on the VCR.

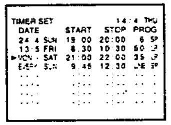
3 Press MENU and select TIMER SET/ CHECK.



```
TIMER SET                14·4 THU
  DATE       START   STOP   PROG
▶ 24·4 SUN   19:00  20:00    6 SP
  13·5 FRI    8:30  10:30   50 LP
  MON - SAT  21:00  22:00   35 LP
  EVERY SUN   9:45  12:30  LINE SP
```

4 Check the timer settings:

- If you do not want to change or cancel the settings, press EXECUTE, then TIMER REC ON/OFF to return to recording standby.
- If you want to change or cancel the settings, press the CURSOR (↑/↓) buttons to move the cursor (▶) to the setting you want to change or cancel.



```
TIMER SET                14·4 THU
  DATE       START   STOP   PROG
  24·4 SUN   19:00  20:00    6 SP
  13·5 FRI    8:30  10:30   50 LP
▶ MON - SAT  21:00  22:00   35 LP
  EVERY SUN   9:45  12:30  LINE SP
```

5 Change or cancel the timer setting:

- To change the setting, press the CURSOR (←/→) buttons to flash the item you want to change, and reset it using the CURSOR (↑/↓) buttons. Then, press CURSOR → to move the cursor to the leftmost column.
- To cancel the setting, press TIMER REC CLEAR.

6 Press EXECUTE.

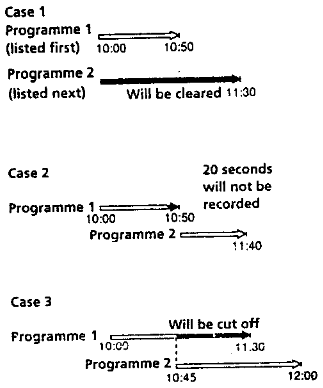
The VCR returns to the original screen. When there are any other timer settings left in the TIMER SET/CHECK menu, press TIMER REC ON/OFF to return to recording standby.

To check the timer settings during timer recording

Press MENU and select TIMER SET/CHECK. After checking, press EXECUTE to turn off the display.

When the timer settings overlap

The VCR will not record overlapping programmes. If any of your timer settings overlap, change the settings.


Case 1
Programme 1 (listed first)
10:00
10:50
Programme 2 (listed next)
Will be cleared
11:30
Case 2
20 seconds will not be recorded
Programme 1
10:00
10:50
Programme 2
11:40
Case 3
Will be cut off
Programme 1
10:00
11:30
Programme 2
10:45
12:00

Case 1: If you preset two programmes to start recording at the same time...

The programme listed first on the TIMER SET/CHECK menu has priority over the other programmes. The timer settings of lower priority programmes will be erased from the TIMER SET/ CHECK menu when the first programme begins recording.

Case 2: If you preset programme 2 to start recording at the same time you preset programme 1 to finish recording...

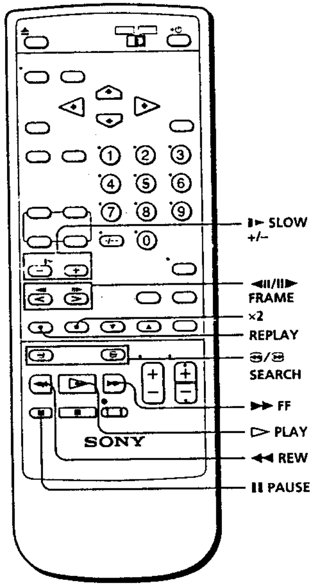
The last 20 seconds of programme 1 will not be recorded because the VCR will enter recording pause for programme 2 before programme 1 is finished.

Case 3: If you preset programme 2 to start recording before programme 1 is finished recording...

Programme 2 will start recording before programme 1 has finished.

Playing/searching at various speeds

You can play back a tape at various speeds: high-speed, slow motion, frame by frame and so on. These options are also useful for searching for a specific point during playback. The sound is muted during these operations.



Tip

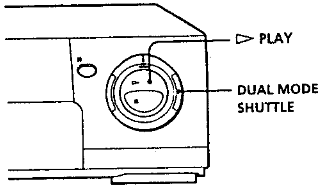
- Adjust the picture using the ▼/▲ TRACKING NORMAL/SLOW STILL ADJUST buttons if:
  - Streaks appear while playing in slow motion.
  - Bands appear on the top or bottom while pausing.
  - The picture shakes while pausing.

Note

- If you use these functions in the LP mode, noise may appear or there may be no colour.

Using the remote commander

Playback options	Operation	To resume normal playback
Playing at twice the normal speed	Press ×2	Press ▷ PLAY.
Fast-forwarding/ Rewinding	During stop, press ▶▶ FF or ◀◀ REW.	Press ▷ PLAY.
Locking in a high-speed picture	During playback or pause, press ⏩ SEARCH or ⏪ SEARCH. To change direction, press ◀II FRAME (backward) or II▶ FRAME (forward).	Press ▷ PLAY.
Locking in a slow-motion picture	During playback or pause, press I▶ SLOW. To change direction, press ◀II FRAME (backward) or II▶ FRAME (forward).	Press ▷ PLAY.
Playing frame by frame	During pause, press II▶ FRAME to advance the picture one frame or ◀II FRAME to reverse the picture one frame.	Press ▷ PLAY.
Playing in reverse	During playback, press ◀II FRAME.	Press ▷PLAY.
Replaying a scene	During playback or pause, press REPLAY and hold it down until the desired scene appears. When you release the button, the scene is played back in slow motion.	Press ▷PLAY. or II PAUSE.



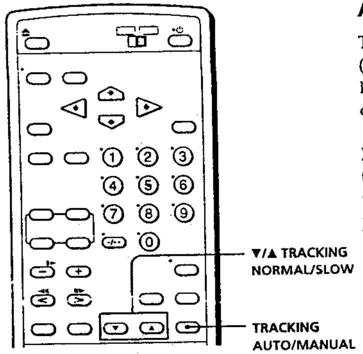
Using the DUAL MODE SHUTTLE (DMS) ring on the VCR

Playback options	Operation	To resume normal playback
Playing at various speeds:	During playback or pause, turn the DMS ring right or left to:	Release the ring.
One-fifth the normal speed	1/5	
Twice the normal speed	×2	
High speed	⏩ or ⏪	
Fast-forward/Rewinding	During Stop, turn the DMS ring to ▶▶ or to ◀◀ and release.	Press ▷ PLAY.
Viewing the picture during fast-forward or rewind	During fast-forward, turn the DMS ring to ▶▶. During rewind, turn the ring to ◀◀.	To return to the previous mode release the right.
Rewind and restart play	During Stop, press ▷ PLAY on the VCR while holding the DMS ring at the ◀◀ position.	——

Adjusting the picture

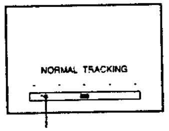
The VCR automatically adjusts the picture for the best possible playback or recording. If, however, you find the automatic adjustment unsatisfactory, you can adjust the picture manually.

Adjusting the tracking



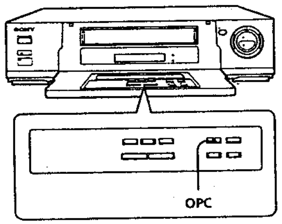
Though the VCR automatically adjusts the tracking when playing a tape (the AUTO TRACKING indicator flashes in the display window, then lights steadily), distortion may occur if the tape was recorded in poor condition. If so, manually adjust the tracking condition.

Press the ▼/▲ TRACKING NORMAL/SLOW buttons to display the tracking meter. The distortion should disappear as you press one of the two buttons. If you cannot get a clear picture with manual adjustment, press TRACKING AUTO/MANUAL to return to automatic adjustment.

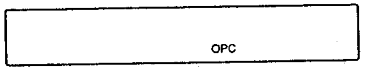


Tracking meter

About Optimum Picture Control (OPC)



Optimum Picture Control (OPC) automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you leave OPC on (with the OPC indicator lit in the VCR's display window).



To use OPC during playback

The OPC function automatically works on all types of tapes, including rental tapes. You can play a tape using the OPC function even if the tape was not recorded with it.

To use OPC while recording

Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the OPC function (the OPC indicator in the display window flashes rapidly). This adjustment is retained until the tape is ejected. There is a short delay before the VCR actually starts recording while the VCR analyses the tape.

If you want to start recording precisely the first time you record, set the VCR to recording pause mode (the OPC indicator in the display window flashes slowly) and press ● REC to let the VCR analyse the tape. When the OPC indicator stops flashing, press ❚❚ PAUSE to start recording. Recording begins immediately.

Tip

- We recommend you leave OPC on even when recording on a tape played back on a VCR without the OPC function.

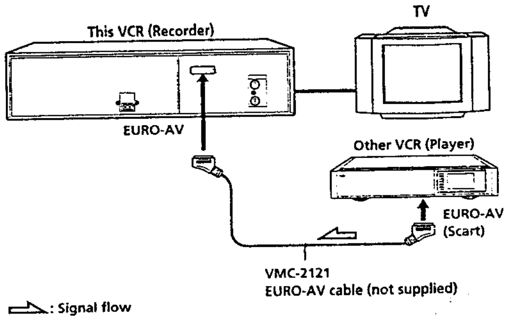
Notes

- Tapes recorded using the OPC function are played back normally on VCRs that do not have the OPC function.
- Press ❚❚ PAUSE to release recording after the OPC indicator stops flashing. If you start recording before the OPC indicator stops flashing, the OPC function is cancelled.

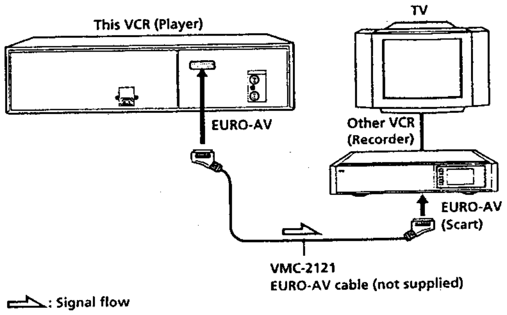
Editing with another VCR

This section shows you how to edit to or from another VCR or camcorder. You can make a copy of a tape using this VCR for recording or playback.

How to hook up to record on this VCR



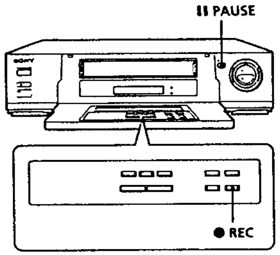
How to hook up to record to another VCR



Tip

- If the other VCR doesn't have a EURO-AV (Scart) connector, use the VMC-2106 EURO-AV cable instead and connect the cable to the line in jacks of the other VCR.

Editing with another VCR
(continued)



Tips

- To release the VCRs from pause, use the ❚❚ PAUSE buttons on the VCRs so that you can edit more precisely.
- To cut out unwanted scenes while editing, press ❚❚ PAUSE on this VCR when an unwanted scene begins. When it ends, press ❚❚ PAUSE again to resume recording (Assemble Editing).

Operation (when recording on this VCR)

Before you start editing

- Press INPUT SELECT to display "L" in the display window.
- Press TAPE SPEED on the remote commander to select the recording tape speed (SP/LP).

1 **Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.**

2 **Insert a tape into this (recording) VCR. Search for the point to start recording and press ❚❚ PAUSE.**

3 **Press ● REC on this VCR and set it to recording pause.**

4 **To start editing, press the ❚❚ PAUSE buttons on both VCRs to release the VCRs from pause.**
For best results, press the pause button on the other VCR just before pressing ❚❚ PAUSE on this VCR.

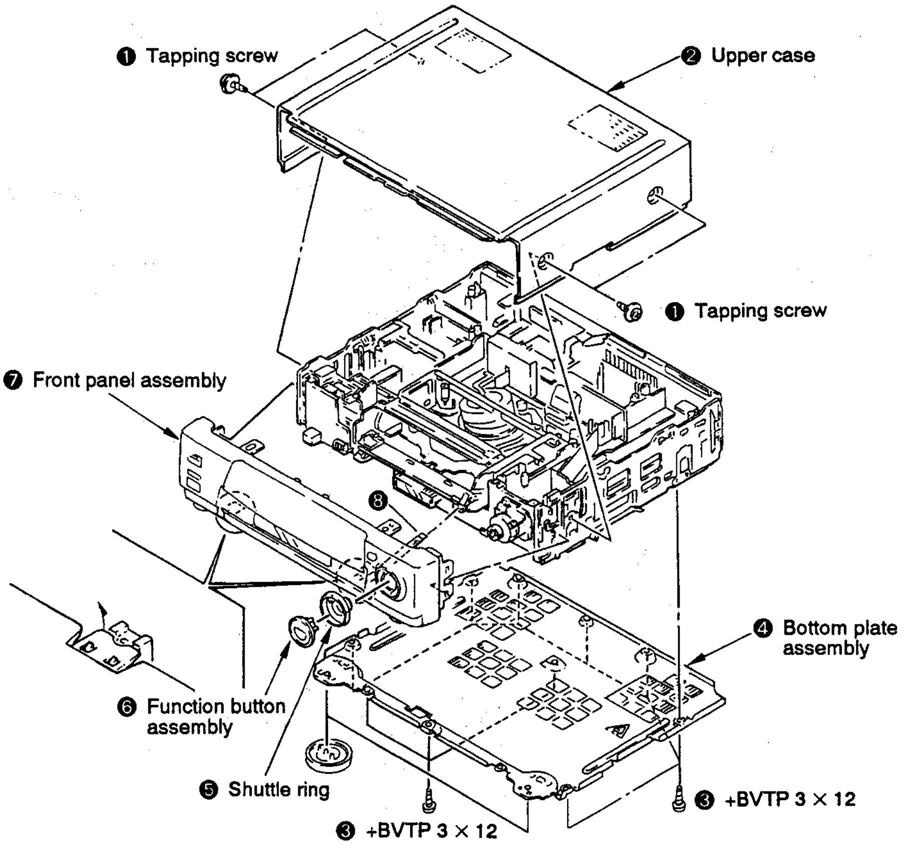
To stop editing

Press the ■ STOP buttons on both VCRs.

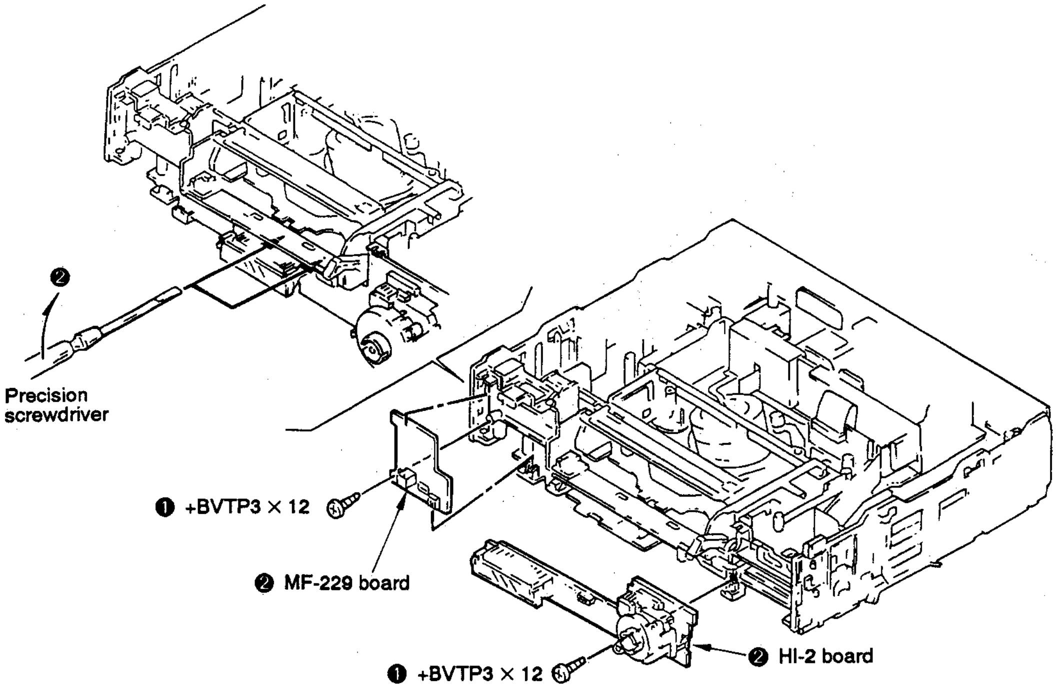
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

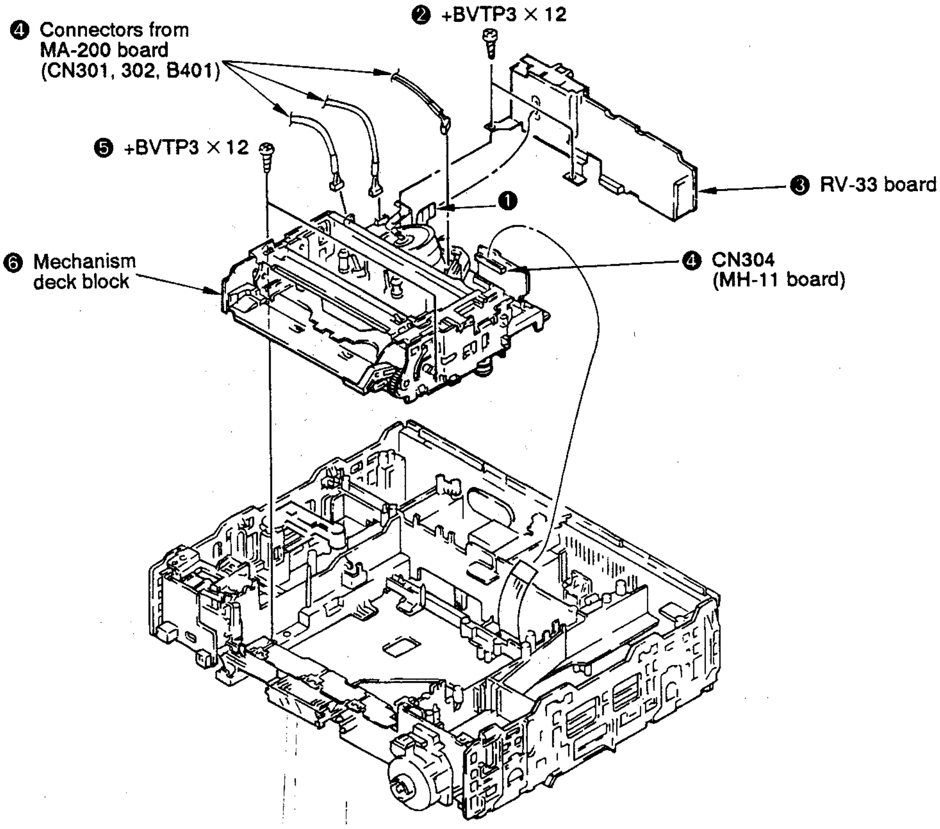
2-1. FRONT PANEL ASSEMBLY


❶ Tapping screw
❷ Upper case
❶ Tapping screw
❼ Front panel assembly
❽
❹ Bottom plate assembly
❻ Function button assembly
❺ Shuttle ring
❸ +BVTP 3 × 12
❸ +BVTP 3 × 12

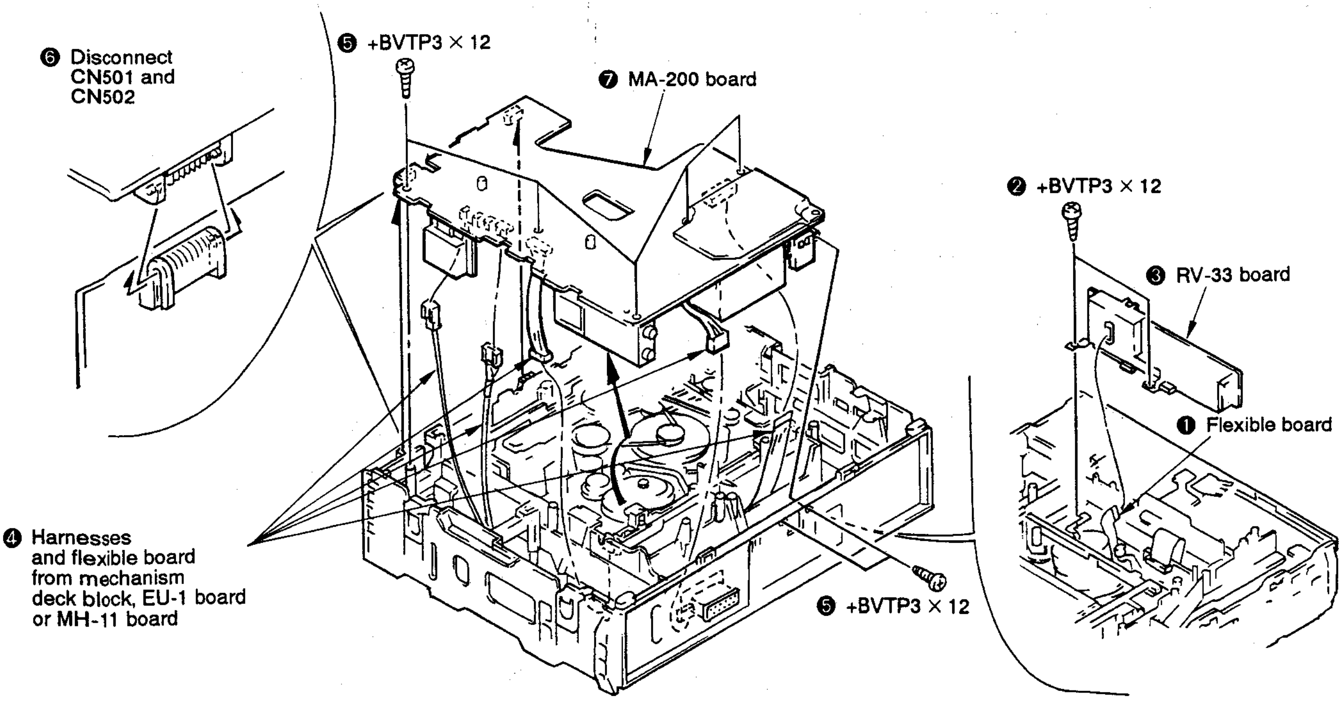
2-2. HI-2 AND MF-229 BOARDS


❷
Precision screwdriver
❶ +BVTP3 × 12
❷ MF-229 board
❶ +BVTP3 × 12
❷ HI-2 board

2-3. RV-33 BOARD AND MECHANISM DECK BLOCK

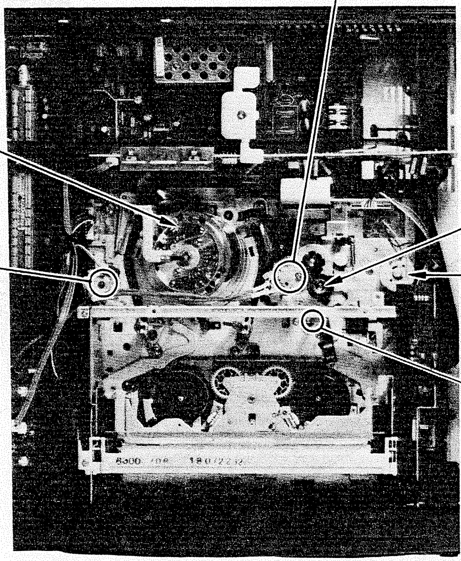

❹ Connectors from MA-200 board (CN301, 302, B401)
❷ +BVTP3 × 12
❺ +BVTP3 × 12
❸ RV-33 board
❶
❻ Mechanism deck block
❹ CN304 (MH-11 board)

2-4. MA-200 BOARD


❻ Disconnect CN501 and CN502
❺ +BVTP3 × 12
❼ MA-200 board
❷ +BVTP3 × 12
❸ RV-33 board
❶ Flexible board
❹ Harnesses and flexible board from mechanism deck block, EU-1 board or MH-11 board
❺ +BVTP3 × 12

2-5. INTERNAL VIEWS

– Top Side –



ACE head assembly
3-947-081-01

M901
Drum assembly
DZH-48A-R
8-848-597-11
Upper drum assembly
DZR-21-R
8-848-540-01

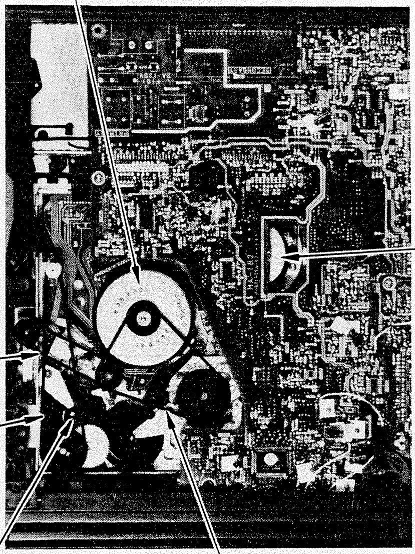
Pinch roller arm assembly
3-947-004-01

FE base assembly
3-946-972-01

M903
Loading motor assembly
3-946-917-01

M902
Capstan motor
3-947-028-01

– Bottom Side –



M902
Capstan motory

M901
Drum assembly

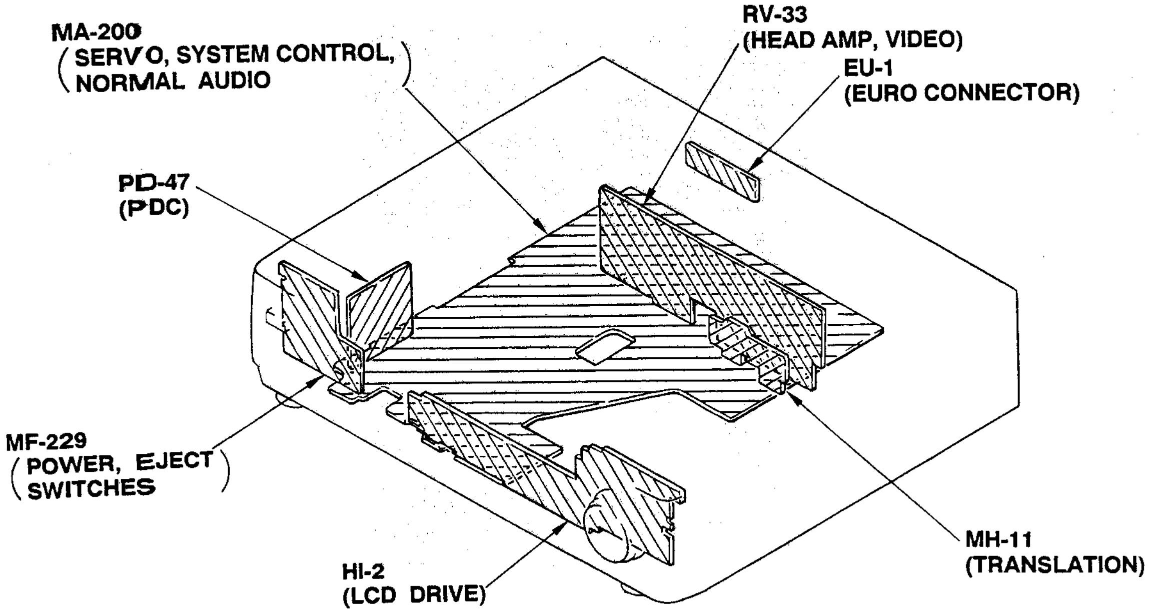
FL belt
3-946-962-01

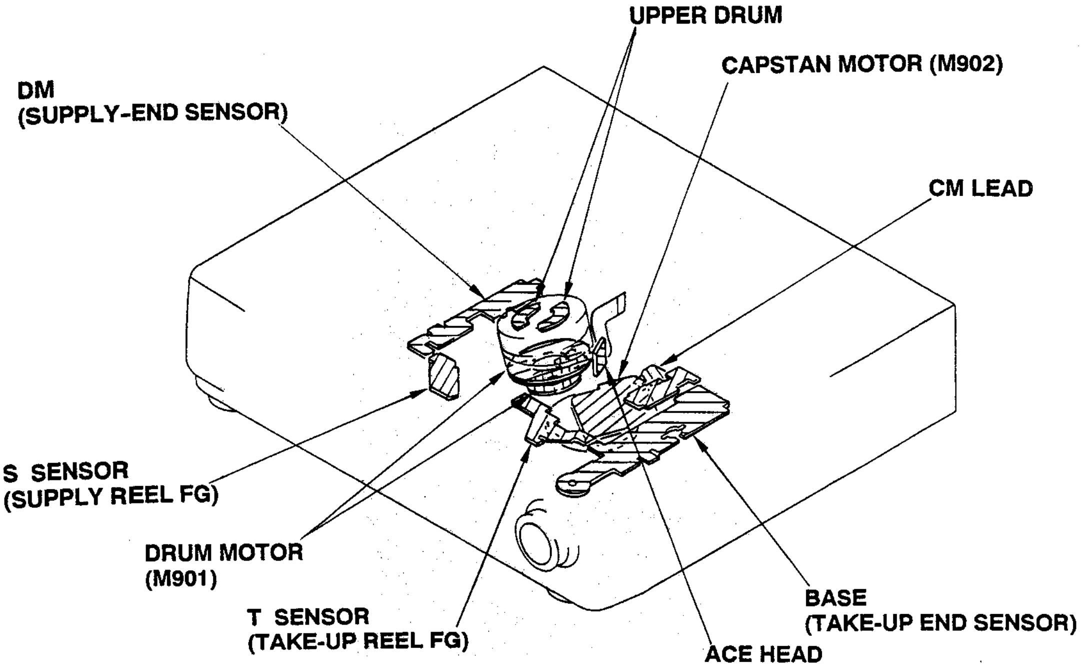
Loading belt
3-946-923-01

Mode switch
3-946-958-01

Drive belt
3-946-999-01

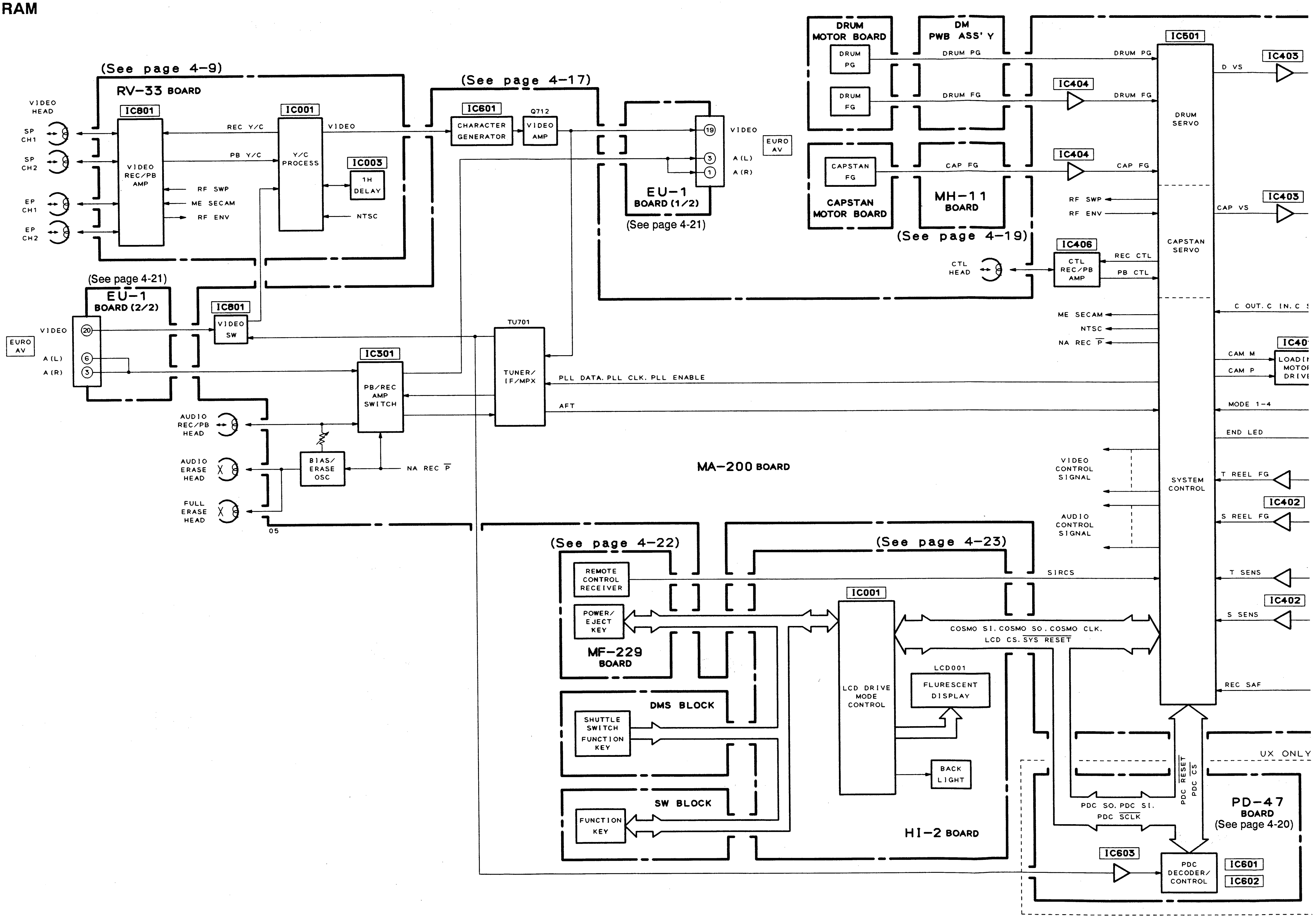
2-6. CIRCUIT BOARDS LOCATION


MA-200
(SERVO, SYSTEM CONTROL, NORMAL AUDIO)
RV-33
(HEAD AMP, VIDEO)
EU-1
(EURO CONNECTOR)
PD-47
(PDC)
MF-229
(POWER, EJECT SWITCHES)
HI-2
(LCD DRIVE)
MH-11
(TRANSLATION)

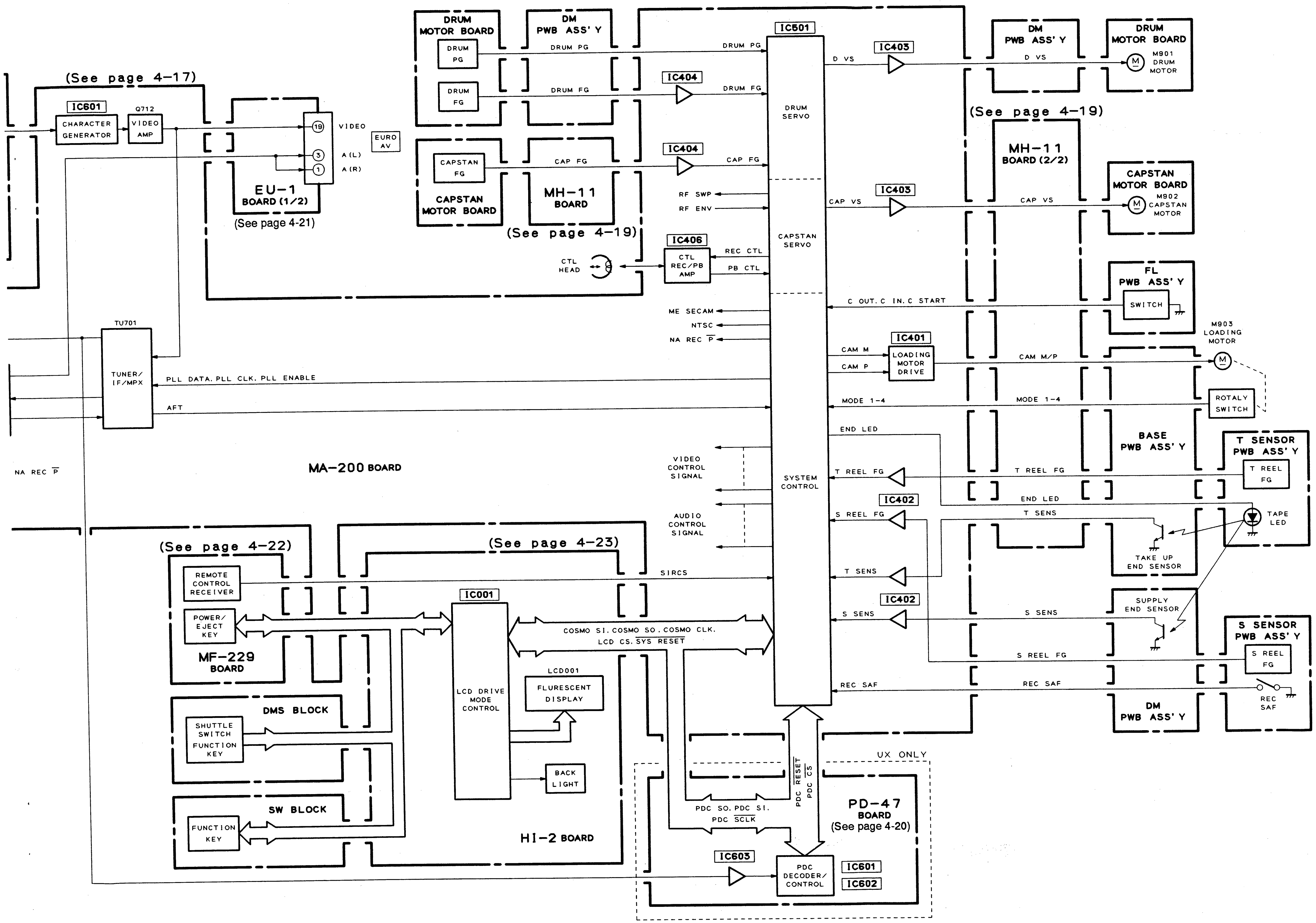

UPPER DRUM
CAPSTAN MOTOR (M902)
DM
(SUPPLY-END SENSOR)
CM LEAD
S SENSOR
(SUPPLY REEL FG)
DRUM MOTOR
(M901)
T SENSOR
(TAKE-UP REEL FG)
BASE
(TAKE-UP END SENSOR)
ACE HEAD

SECTION 3
BLOCK DIAGRAMS

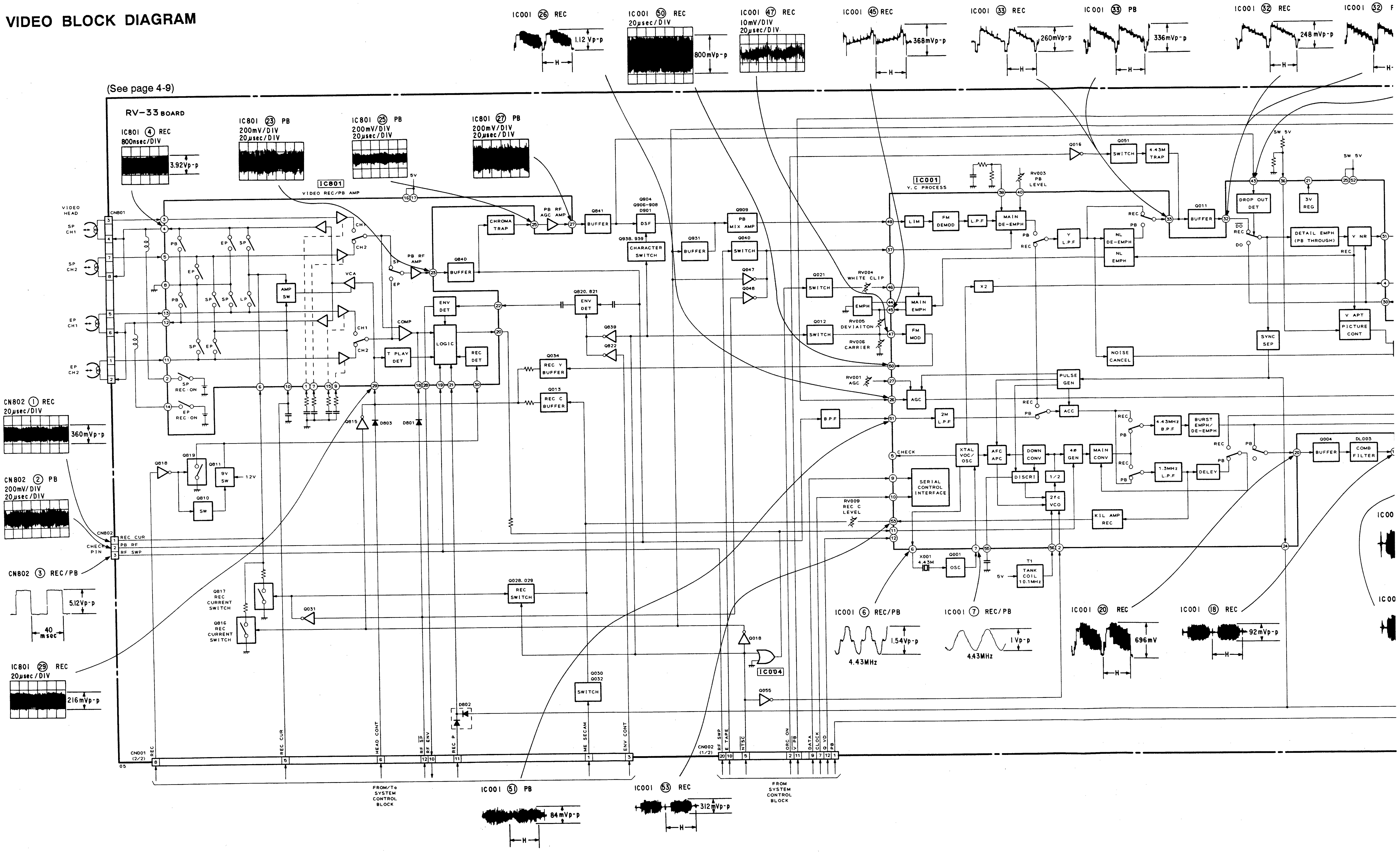
3-1. OVERALL BLOCK DIAGRAM

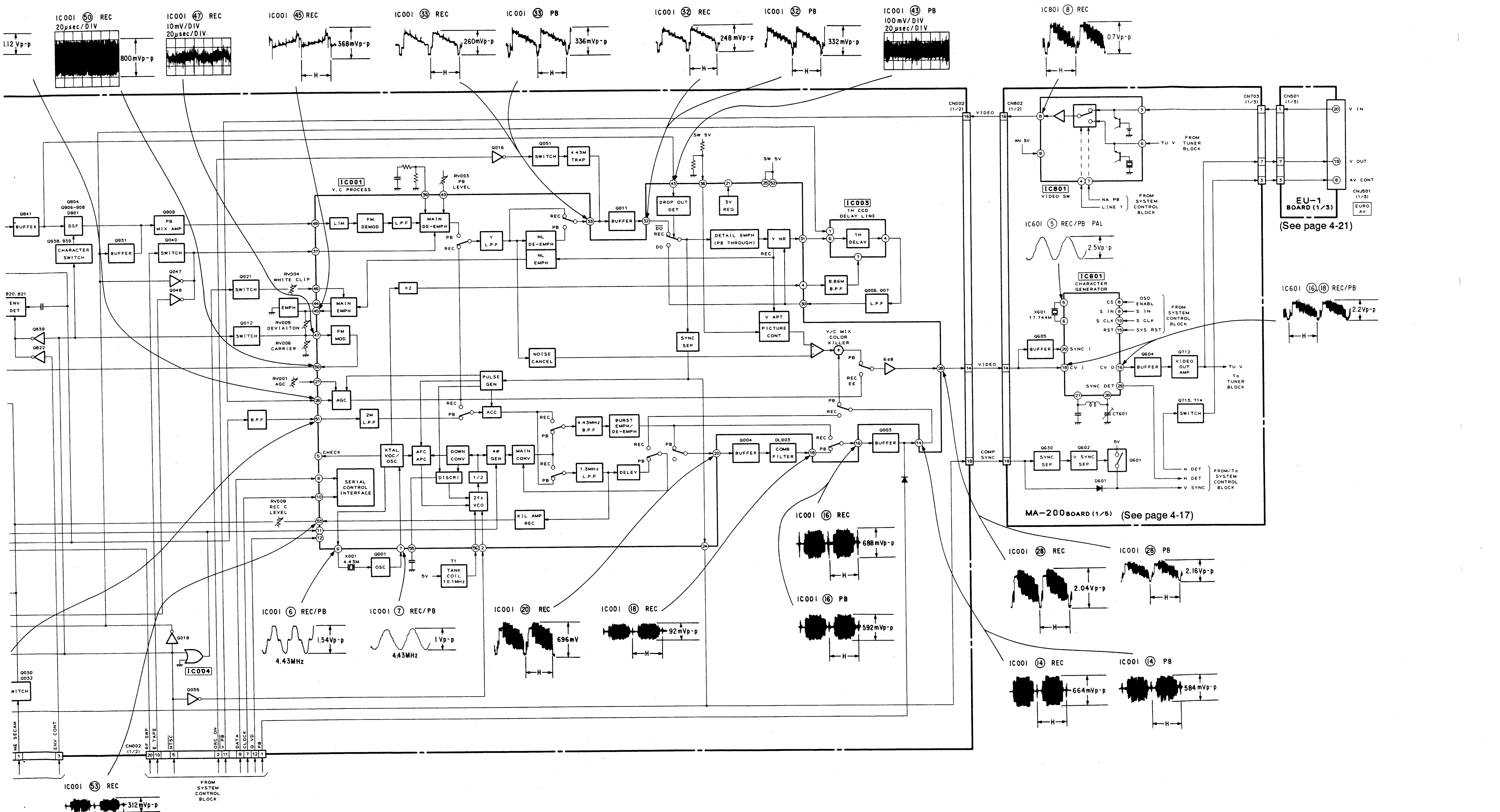


(See page 4-9)
RV-33 BOARD
VIDEO HEAD
SP CH1
SP CH2
EP CH1
EP CH2
IC801
VIDEO REC/PB AMP
REC Y/C
PB Y/C
RF SWP
ME SECAM
RF ENV
IC001
Y/C PROCESS
VIDEO
IC003
1H DELAY
NTSC
(See page 4-17)
IC601
CHARACTER GENERATOR
Q712
VIDEO AMP
VIDEO
A (L)
A (R)
EURO AV
EU-1
BOARD (1/2)
(See page 4-21)
DRUM MOTOR BOARD
DRUM PG
DRUM FG
DM PWB ASS' Y
CAPSTAN FG
CAPSTAN MOTOR BOARD
CAP FG
MH-11 BOARD
(See page 4-19)
IC404
IC404
IC406
CTL HEAD
CTL REC/PB AMP
REC CTL
PB CTL
RF SWP
RF ENV
IC501
DRUM SERVO
CAPSTAN SERVO
SYSTEM CONTROL
D VS
IC403
IC403
CAP VS
C OUT. C IN. C
IC40
LOAD MOTO DRIVE
CAM M
CAM P
MODE 1-4
END LED
T REEL FG
IC402
S REEL FG
T SENS
IC402
S SENS
REC SAF
ME SECAM
NTSC
NA REC P̄
(See page 4-21)
EU-1
BOARD (2/2)
EURO AV
VIDEO
A (L)
A (R)
IC801
VIDEO SW
IC301
PB/REC AMP SWITCH
TU701
TUNER/ IF/MPX
PLL DATA. PLL CLK. PLL ENABLE
AFT
AUDIO REC/PB HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
BIAS/ ERASE OSC
NA REC P̄
05
MA-200 BOARD
VIDEO CONTROL SIGNAL
AUDIO CONTROL SIGNAL
SIRCS
(See page 4-22)
REMOTE CONTROL RECEIVER
POWER/ EJECT KEY
MF-229 BOARD
DMS BLOCK
SHUTTLE SWITCH
FUNCTION KEY
SW BLOCK
FUNCTION KEY
(See page 4-23)
IC001
LCD DRIVE MODE CONTROL
COSMO SI. COSMO SO. COSMO CLK.
LCD CS. SYS RESET
LCD001
FLURESCENT DISPLAY
BACK LIGHT
HI-2 BOARD
PDC SO. PDC SI.
PDC SCLK
PDC RESET
PDC CS
UX ONLY
PD-47 BOARD
(See page 4-20)
IC603
PDC DECODER/ CONTROL
IC601
IC602

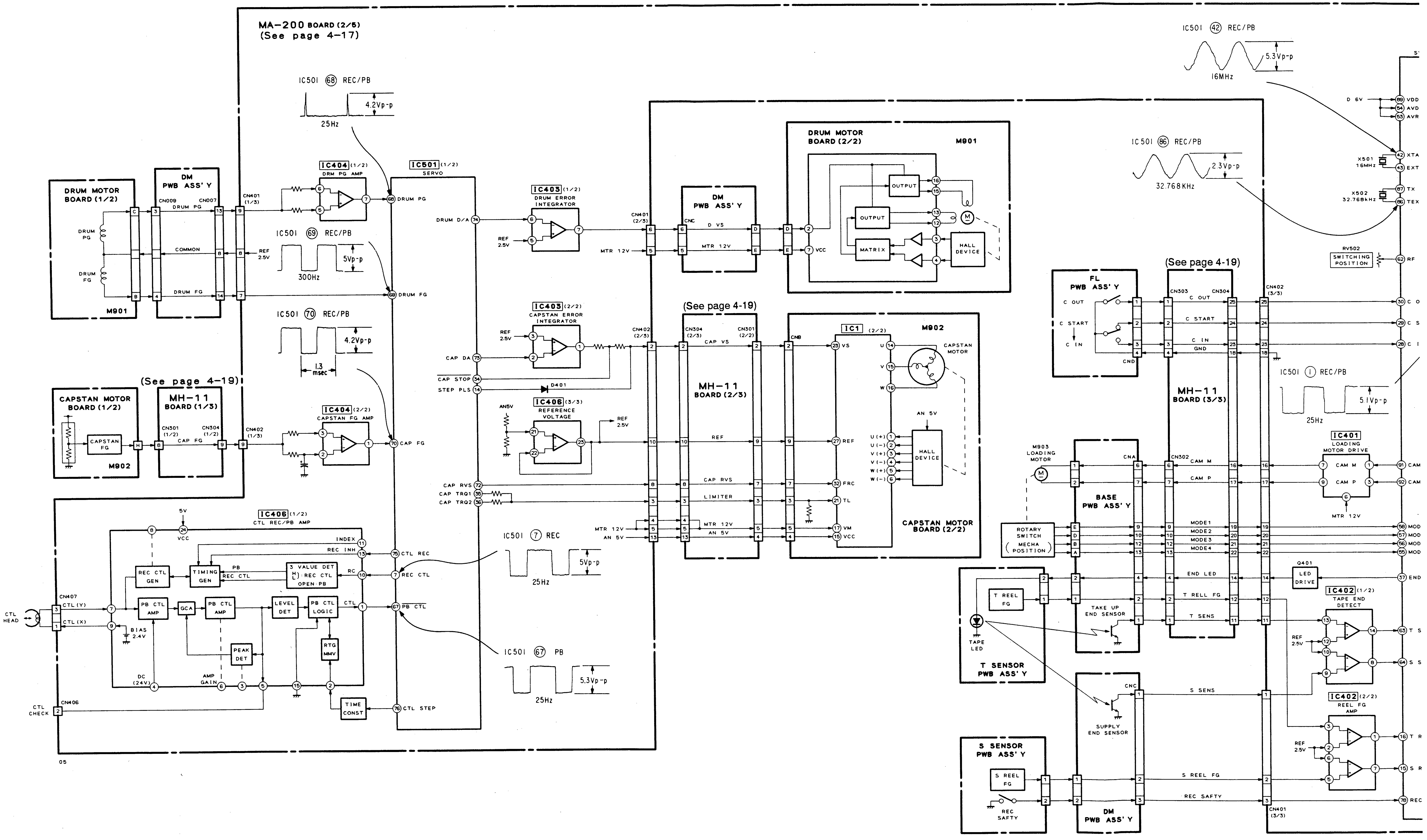

(See page 4-17)
IC601
CHARACTER GENERATOR
Q712
VIDEO AMP
19
3
1
VIDEO
A (L)
A (R)
EURO AV
EU-1
BOARD (1/2)
(See page 4-21)
DRUM MOTOR BOARD
DRUM PG
DRUM FG
DM PWB ASS'Y
DRUM PG
DRUM FG
CAPSTAN FG
CAPSTAN MOTOR BOARD
CAP FG
MH-11 BOARD
(See page 4-19)
IC404
IC404
DRUM PG
DRUM FG
CAP FG
RF SWP
RF ENV
IC406
CTL REC/PB AMP
CTL HEAD
REC CTL
PB CTL
IC501
DRUM SERVO
CAPSTAN SERVO
SYSTEM CONTROL
ME SECAM
NTSC
NA REC P
TU701
TUNER/ IF/MPX
PLL DATA. PLL CLK. PLL ENABLE
AFT
NA REC P
MA-200 BOARD
VIDEO CONTROL SIGNAL
AUDIO CONTROL SIGNAL
SIRCS
IC403
D VS
IC403
CAP VS
DM PWB ASS'Y
D VS
DRUM MOTOR BOARD
M901 DRUM MOTOR
(See page 4-19)
MH-11 BOARD (2/2)
CAP VS
CAPSTAN MOTOR BOARD
M902 CAPSTAN MOTOR
FL PWB ASS'Y
SWITCH
C OUT. C IN. C START
IC401
LOADING MOTOR DRIVE
CAM M
CAM P
CAM M/P
M903 LOADING MOTOR
MODE 1-4
MODE 1-4
ROTALY SWITCH
END LED
BASE PWB ASS'Y
T SENSOR PWB ASS'Y
T REEL FG
T REEL FG
T REEL FG
END LED
T SENS
TAPE LED
IC402
S REEL FG
TAKE UP END SENSOR
T SENS
IC402
S SENS
S SENS
SUPPLY END SENSOR
S SENSOR PWB ASS'Y
S REEL FG
S REEL FG
REC SAF
REC SAF
REC SAF
DM PWB ASS'Y
(See page 4-22)
REMOTE CONTROL RECEIVER
POWER/ EJECT KEY
MF-229 BOARD
DMS BLOCK
SHUTTLE SWITCH
FUNCTION KEY
SW BLOCK
FUNCTION KEY
(See page 4-23)
IC001
LCD DRIVE MODE CONTROL
LCD001
FLURESCENT DISPLAY
BACK LIGHT
HI-2 BOARD
COSMO SI. COSMO SO. COSMO CLK.
LCD CS. SYS RESET
UX ONLY
PDC RESET
PDC CS
PDC SO. PDC SI.
PDC SCLK
PD-47 BOARD
(See page 4-20)
IC603
PDC DECODER/ CONTROL
IC601
IC602

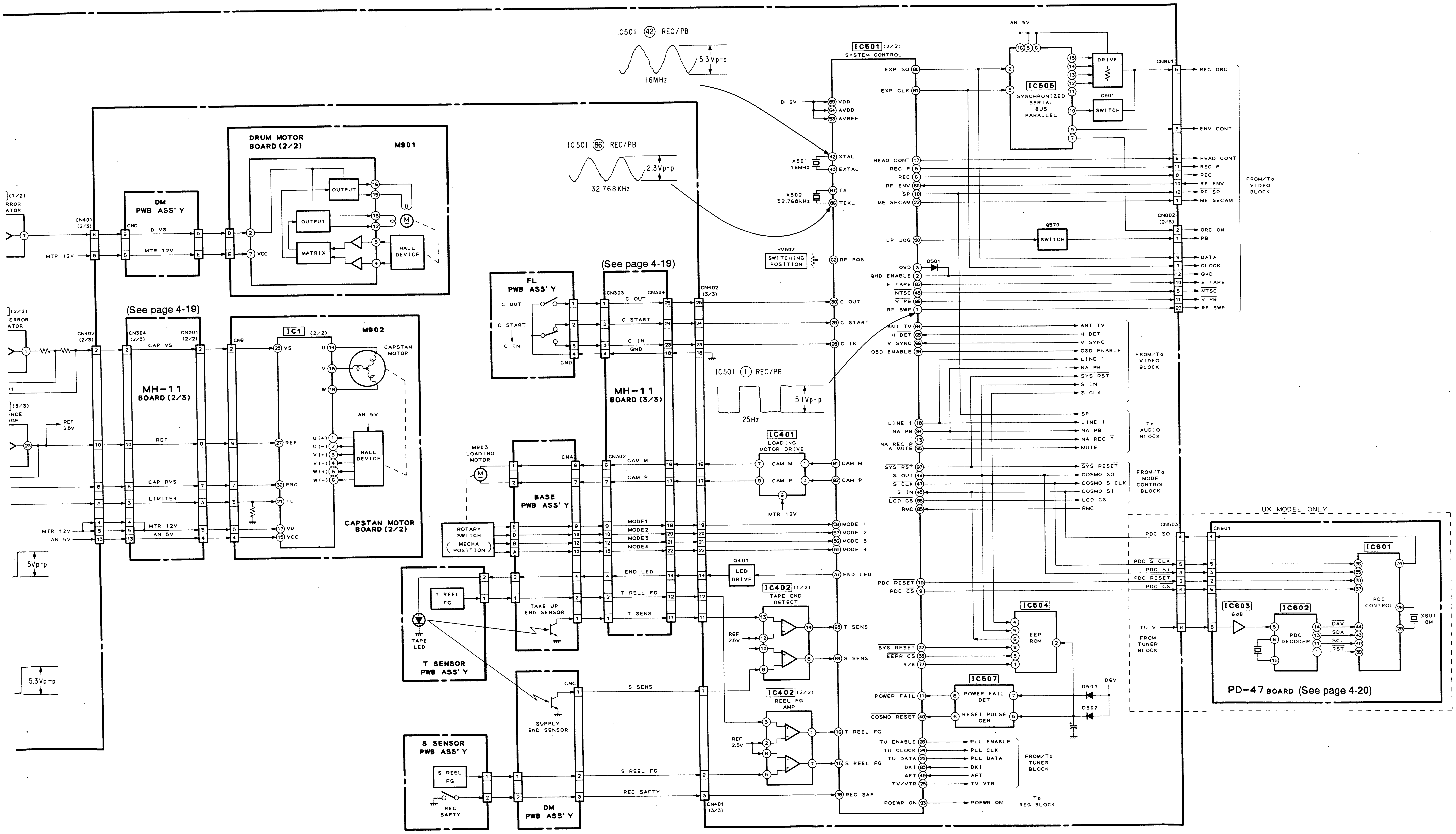
3-2. VIDEO BLOCK DIAGRAM


(See page 4-9)
RV-33 BOARD
IC801 ④ REC 800nsec/DIV 3.92Vp-p
IC801 ㉓ PB 200mV/DIV 20μsec/DIV
IC801 ㉕ PB 200mV/DIV 20μsec/DIV
IC801 ㉗ PB 200mV/DIV 20μsec/DIV
IC001 ㉖ REC 1.12Vp-p
IC001 (50) REC 20μsec/DIV 800mVp-p
IC001 ㊼ REC 10mV/DIV 20μsec/DIV
IC001 ㊺ REC 368mVp-p
IC001 ㉝ REC 260mVp-p
IC001 ㉝ PB 336mVp-p
IC001 ㉜ REC 248mVp-p
IC801 VIDEO REC/PB AMP
IC001 Y.C PROCESS
VIDEO HEAD
SP CH1
SP CH2
EP CH1
EP CH2
CN801
CHROMA TRAP
PB RF AGC AMP
BUFFER
DSF
CHARACTER SWITCH
PB MIX AMP
SWITCH
LIM
FM DEMOD
L.P.F
MAIN DE-EMPH
Y L.P.F
NL DE-EMPH
NL EMPH
DETAIL EMPH (PB THROUGH)
V NR
DROP OUT DET
3V REG
4.43M TRAP
WHITE CLIP
DEVIATION
CARRIER
EMPH
MAIN EMPH
FM MOD
X2
V APT
PICTURE CONT
SYNC SEP
NOISE CANCEL
PULSE GEN
AGC
ACC
B.P.F
2M L.P.F
4.43MHz B.P.F
BURST EMPH/DE-EMPH
XTAL VCO/OSC
AFC APC
DOWN CONV
4Ø GEN
MAIN CONV
DISCRI
1/2
2fc VCO
1.3MHz L.P.F
DELEY
COMB FILTER
KIL AMP REC
SERIAL CONTROL INTERFACE
ENV DET
LOGIC
REC DET
T PLAY DET
AMP SW
VCA
COMP
REC Y BUFFER
REC C BUFFER
REC SWITCH
REC CURRENT SWITCH
OSC
TANK COIL 10.1MHz
CN802 ① REC 20μsec/DIV 360mVp-p
CN802 ② PB 200mV/DIV 20μsec/DIV
CN802 ③ REC/PB 5.12Vp-p 40 msec
IC801 ㉙ REC 20μsec/DIV 216mVp-p
IC001 ⑥ REC/PB 1.54Vp-p 4.43MHz
IC001 ⑦ REC/PB 1Vp-p 4.43MHz
IC001 ⑳ REC 696mV
IC001 ⑱ REC 92mVp-p
IC001 (51) PB 84mVp-p
IC001 (53) REC 312mVp-p
CN001 (2/2)
CN002 (1/2)
FROM/To SYSTEM CONTROL BLOCK
FROM SYSTEM CONTROL BLOCK
IC004

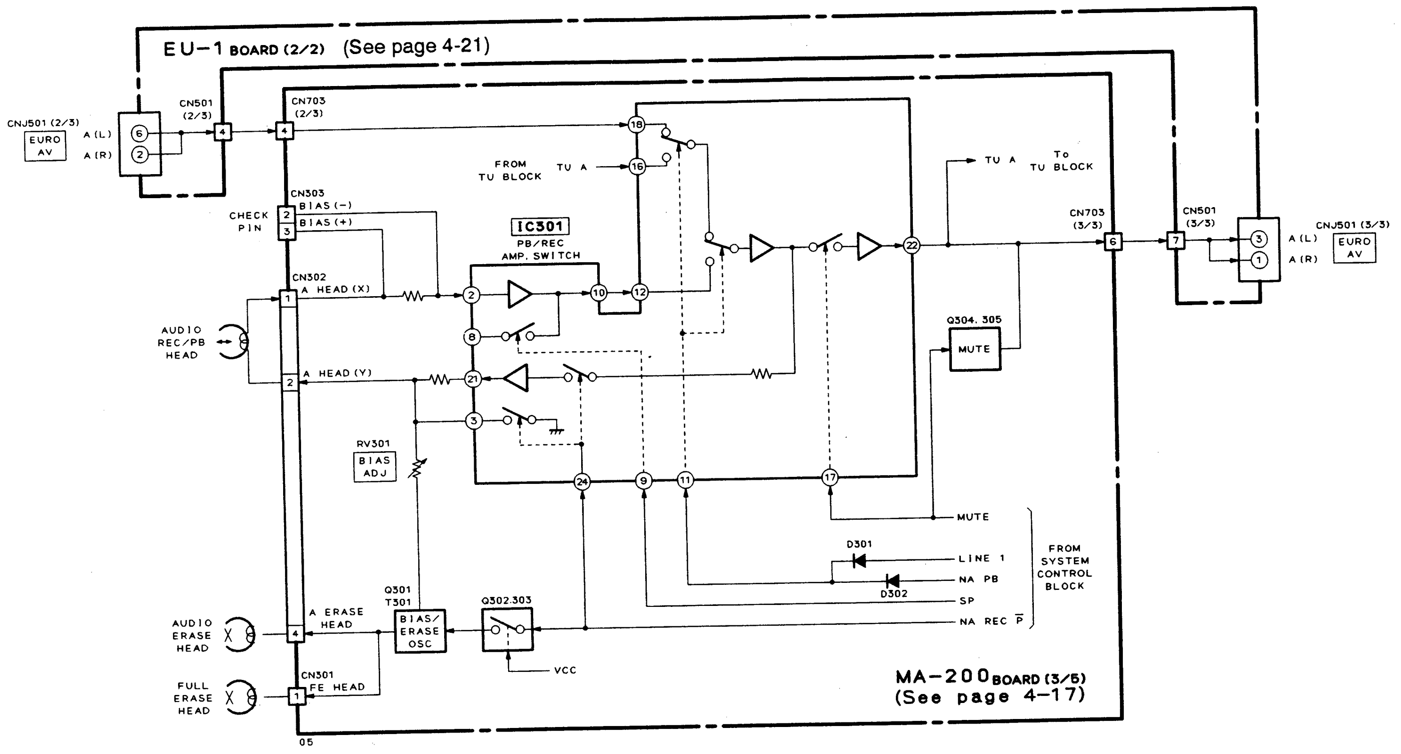

IC001 (50) REC
20μsec/DIV
800mVp-p
1.12Vp-p
IC001 (47) REC
10mV/DIV
20μsec/DIV
IC001 (45) REC
368mVp-p
IC001 (33) REC
260mVp-p
IC001 (33) PB
336mVp-p
IC001 (32) REC
248mVp-p
IC001 (32) PB
332mVp-p
IC001 (43) PB
100mV/DIV
20μsec/DIV
IC801 (8) REC
0.7Vp-p
H
IC001
Y.C PROCESS
LIM
FM DEMOD
L.P.F
MAIN DE-EMPH
Y L.P.F
NL DE-EMPH
NL EMPH
Q016
Q051
SWITCH
4.43M TRAP
RV003
PB LEVEL
Q011
BUFFER
DROP OUT DET
3V REG
SW 5V
DETAIL EMPH (PB THROUGH)
Y NR
IC003
1H CCD DELAY LINE
1H DELAY
8.86M B.P.F
Q006, 007
L.P.F
V APT
PICTURE CONT
SYNC SEP
NOISE CANCEL
Y/C MIX
COLOR KILLER
6dB
Q841
BUFFER
Q904
Q906-908
D901
DSF
Q909
PB MIX AMP
Q938, 939
CHARACTER SWITCH
Q931
BUFFER
Q040
SWITCH
Q047
Q048
Q021
SWITCH
RV004
WHITE CLIP
EMPH
MAIN EMPH
Q012
SWITCH
RV005
DEVIAITON
RV006
CARRIER
FM MOD
x2
Q820, 821
ENV DET
Q839
Q822
RV001
AGC
PULSE GEN
ACC
B.P.F
2M L.P.F
4.43MHz B.P.F
BURST EMPH/ DE-EMPH
1.3MHz L.P.F
DELEY
Q004
BUFFER
DL003
COMB FILTER
Q003
BUFFER
CHECK
XTAL VOC/ OSC
AFC APC
DOWN CONV
4θ GEN
MAIN CONV
DISCRI
1/2
2fc VCO
SERIAL CONTROL INTERFACE
RV009
REC C LEVEL
KIL AMP REC
X001
4.43M
Q001
OSC
T1
TANK COIL
10.1MHz
5V
REC
PB
EE
DO
Q018
IC004
Q055
Q030
Q032
SWITCH
ME SECAM
ENV CONT
CN002 (1/2)
RF SWP
E TAPE
NTSC
OREC ON
V PB
DATA
CLOCK
VD
PB
FROM SYSTEM CONTROL BLOCK
IC001 (53) REC
312mVp-p
IC001 (6) REC/PB
1.54Vp-p
4.43MHz
IC001 (7) REC/PB
1Vp-p
4.43MHz
IC001 (20) REC
696mV
IC001 (18) REC
92mVp-p
IC001 (16) REC
688mVp-p
IC001 (16) PB
592mVp-p
CN002 (1/2)
VIDEO
COMP SYNC
CN802 (1/2)
AN 5V
IC801
VIDEO SW.
NA PB
LINE 1
FROM SYSTEM CONTROL BLOCK
TU V
FROM TUNER BLOCK
IC601 (5) REC/PB PAL
2.5Vp-p
IC601
CHARACTER GENERATOR
X601
17.744M
CS
S IN
S CLK
RST
OSD ENABL
SYS RST
FROM SYSTEM CONTROL BLOCK
Q605
BUFFER
SYNC 1
CV 1
CV O
Q604
BUFFER
Q712
VIDEO OUT AMP
TU V
To TUNER BLOCK
SYNC DET
CT601
Q713, 714
SWITCH
Q630
SYNC SEP
Q602
V SYNC SEP
Q601
D601
H DET
V SYNC
FROM/To SYSTEM CONTROL BLOCK
MA-200 BOARD (1/5)
(See page 4-17)
CN703 (1/3)
CN501 (1/3)
V IN
V OUT
AV CONT
CNJ501 (1/3)
EURO AV
EU-1 BOARD (1/3)
(See page 4-21)
IC601 (16),(18) REC/PB
2.2Vp-p
IC001 (28) REC
2.04Vp-p
IC001 (28) PB
2.16Vp-p
IC001 (14) REC
664mVp-p
IC001 (14) PB
584mVp-p

3-3. SERVO, SYSTEM CONTROL BLOCK DIAGRAM

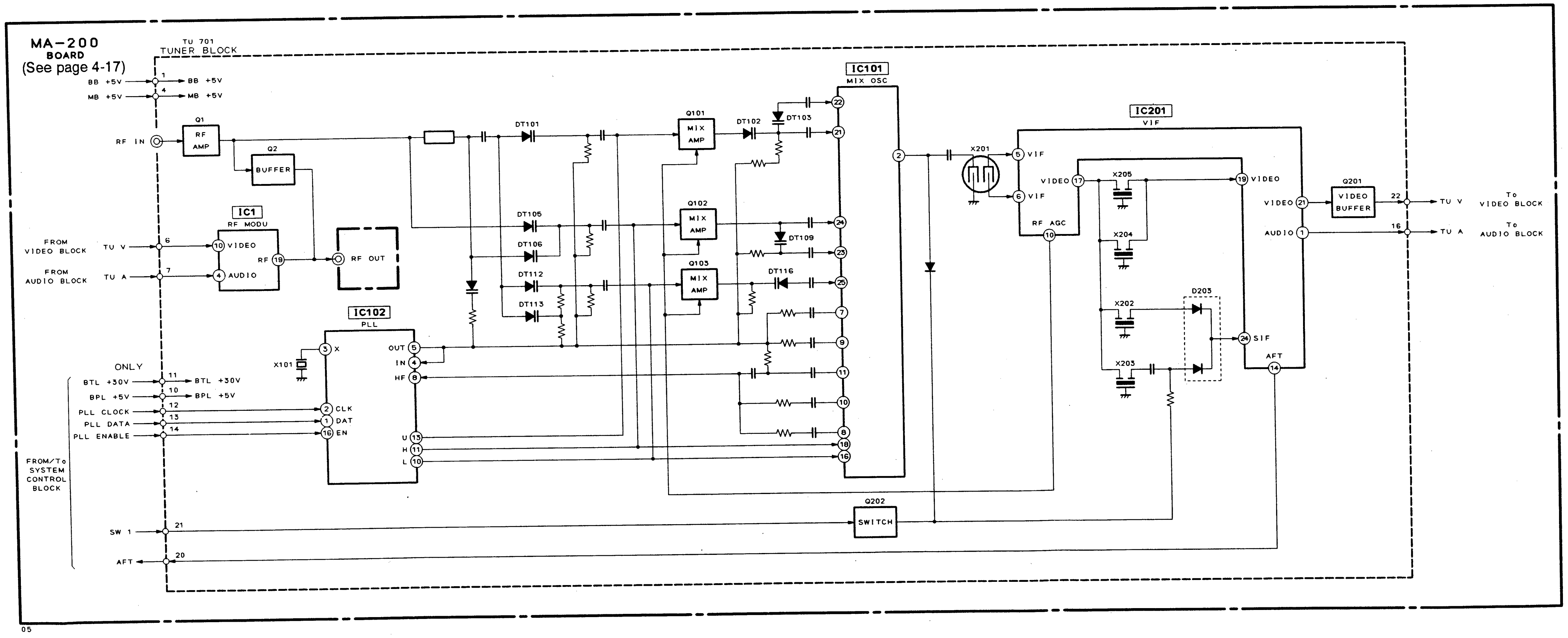

MA-200 BOARD (2/5)
(See page 4-17)
IC501 68 REC/PB
4.2Vp-p
25Hz
IC501 69 REC/PB
5Vp-p
300Hz
IC501 70 REC/PB
4.2Vp-p
1.3 msec
DRUM MOTOR BOARD (1/2)
DRUM PG
DRUM FG
M901
DM PWB ASS'Y
CN009
CN007
COMMON
CN401 (1/3)
REF 2.5V
IC404 (1/2) DRM PG AMP
IC501 (1/2) SERVO
DRUM PG
DRUM FG
DRUM D/A
CAP DA
CAP STOP
STEP PLS
CAP FG
CAP RVS
CAP TRQ1
CAP TRQ2
CTL REC
REC CTL
PB CTL
CTL STEP
IC403 (1/2) DRUM ERROR INTEGRATOR
IC403 (2/2) CAPSTAN ERROR INTEGRATOR
IC404 (2/2) CAPSTAN FG AMP
IC406 (3/3) REFERENCE VOLTAGE
AN5V
D401
CAPSTAN MOTOR BOARD (1/2)
CAPSTAN FG
M902
(See page 4-19)
MH-11 BOARD (1/3)
CN301 (1/2)
CN304 (1/2)
CN402 (1/3)
IC406 (1/2) CTL REC/PB AMP
5V
VCC
INDEX
REC INH
REC CTL GEN
TIMING GEN
PB
REC CTL
3 VALUE DET H: REC CTL L: OPEN PB
RC
PB CTL AMP
GCA
PB CTL AMP
LEVEL DET
PB CTL LOGIC
CTL
PEAK DET
RTG MMV
TIME CONST
BIAS 2.4V
DC (24V)
AMP GAIN
CN407
CTL (Y)
CTL (X)
CTL HEAD
CTL CHECK
CN406
IC501 7 REC
5Vp-p
25Hz
IC501 67 PB
5.3Vp-p
25Hz
MTR 12V
AN 5V
CN401 (2/3)
CN402 (2/3)
DM PWB ASS'Y
D VS
MTR 12V
DRUM MOTOR BOARD (2/2)
M901
OUTPUT
MATRIX
HALL DEVICE
VCC
(See page 4-19)
MH-11 BOARD (2/3)
CN304 (2/3)
CN301 (2/2)
CAP VS
REF
CAP RVS
LIMITER
IC1 (2/2)
M902
CAPSTAN MOTOR
VS
FRC
TL
VM
AN 5V
CAPSTAN MOTOR BOARD (2/2)
IC501 42 REC/PB
5.3Vp-p
16MHz
IC501 86 REC/PB
2.3Vp-p
32.768KHz
D 6V
VDD
AVD
AVR
X501 16MHz
XTA
EXT
X502 32.768kHz
TX
TEX
RV502 SWITCHING POSITION
RF
FL PWB ASS'Y
C OUT
C START
C IN
GND
(See page 4-19)
CN303
CN304
MH-11 BOARD (3/3)
CN402 (3/3)
IC501 1 REC/PB
5.1Vp-p
25Hz
IC401 LOADING MOTOR DRIVE
CAM M
CAM P
MTR 12V
M903 LOADING MOTOR
BASE PWB ASS'Y
CN302
ROTARY SWITCH (MECHA POSITION)
MODE1
MODE2
MODE3
MODE4
END LED
Q401 LED DRIVE
T REEL FG
TAPE LED
T SENSOR PWB ASS'Y
TAKE UP END SENSOR
T RELL FG
T SENS
IC402 (1/2) TAPE END DETECT
REF 2.5V
SUPPLY END SENSOR
S SENS
IC402 (2/2) REEL FG AMP
S SENSOR PWB ASS'Y
S REEL FG
REC SAFTY
DM PWB ASS'Y
S REEL FG
REC SAFTY
CN401 (3/3)
05


IC501 ㊷ REC/PB
5.3Vp-p
16MHz
IC501 ㊻ REC/PB
2.3Vp-p
32.768KHz
IC501 ① REC/PB
5.1Vp-p
25Hz
DRUM MOTOR BOARD (2/2)
M901
OUTPUT
MATRIX
HALL DEVICE
DM PWB ASS'Y
D VS
MTR 12V
CN401 (2/3)
CN402 (2/3)
(See page 4-19)
MH-11 BOARD (2/3)
CN304 (2/3)
CN301 (2/2)
CAP VS
REF
CAP RVS
LIMITER
MTR 12V
AN 5V
IC1 (2/2)
M902
CAPSTAN MOTOR
CAPSTAN MOTOR BOARD (2/2)
VS
REF
FRC
TL
VM
VCC
REF 2.5V
5Vp-p
5.3Vp-p
FL PWB ASS'Y
C OUT
C START
C IN
GND
(See page 4-19)
CN303
CN304
MH-11 BOARD (3/3)
CN402 (3/3)
CN302
CAM M
CAM P
MODE1
MODE2
MODE3
MODE4
END LED
T REEL FG
T SENS
M903 LOADING MOTOR
BASE PWB ASS'Y
ROTARY SWITCH (MECHA POSITION)
T SENSOR PWB ASS'Y
T REEL FG
TAPE LED
TAKE UP END SENSOR
SUPPLY END SENSOR
S SENS
S SENSOR PWB ASS'Y
S REEL FG
REC SAFTY
DM PWB ASS'Y
S REEL FG
REC SAFTY
CN401 (3/3)
IC401 LOADING MOTOR DRIVE
MTR 12V
Q401 LED DRIVE
IC402 (1/2) TAPE END DETECT
REF 2.5V
IC402 (2/2) REEL FG AMP
IC501 (2/2) SYSTEM CONTROL
D 6V
VDD
AVDD
AVREF
X501 16MHz
XTAL
EXTAL
X502 32.768kHz
TX
TEXL
RV502 SWITCHING POSITION
RF POS
EXP SO
EXP CLK
HEAD CONT
REC P
REC
RF ENV
SP
ME SECAM
LP JOG
QVD
QHD ENABLE
E TAPE
NTSC
V PB
RF SWP
ANT TV
H DET
V SYNC
OSD ENABLE
LINE 1
NA PB
NA REC P
A MUTE
SYS RST
S OUT
S CLK
S IN
LCD CS
RMC
C OUT
C START
C IN
CAM M
CAM P
MODE 1
MODE 2
MODE 3
MODE 4
END LED
T SENS
S SENS
T REEL FG
S REEL FG
REC SAF
PDC RESET
PDC CS
SYS RESET
EEPR CS
R/B
POWER FAIL
COSMO RESET
TU ENABLE
TU CLOCK
TU DATA
DKI
AFT
TV/VTR
POEWR ON
D501
AN 5V
IC505 SYNCHRONIZED SERIAL BUS PARALLEL
DRIVE
Q501 SWITCH
Q570 SWITCH
CN801
REC ORC
ENV CONT
HEAD CONT
REC P
REC
RF ENV
RF SP
ME SECAM
CN802 (2/3)
ORC ON
PB
DATA
CLOCK
QVD
E TAPE
NTSC
V PB
RF SWP
FROM/To VIDEO BLOCK
ANT TV
H DET
V SYNC
OSD ENABLE
LINE 1
NA PB
SYS RST
S IN
S CLK
FROM/To VIDEO BLOCK
SP
LINE 1
NA PB
NA REC P
MUTE
To AUDIO BLOCK
SYS RESET
COSMO SO
COSMO S CLK
COSMO SI
LCD CS
RMC
FROM/To MODE CONTROL BLOCK
IC504 EEP ROM
IC507 POWER FAIL DET
RESET PULSE GEN
D503
D502
D6V
PLL ENABLE
PLL CLK
PLL DATA
DKI
AFT
TV VTR
FROM/To TUNER BLOCK
POEWR ON
To REG BLOCK
UX MODEL ONLY
CN503
PDC SO
PDC S CLK
PDC SI
PDC RESET
PDC CS
TU V
FROM TUNER BLOCK
CN601
IC601
PDC CONTROL
X601 8M
IC603 6dB
IC602 PDC DECODER
DAV
SDA
SCL
RST
PD-47 BOARD (See page 4-20)

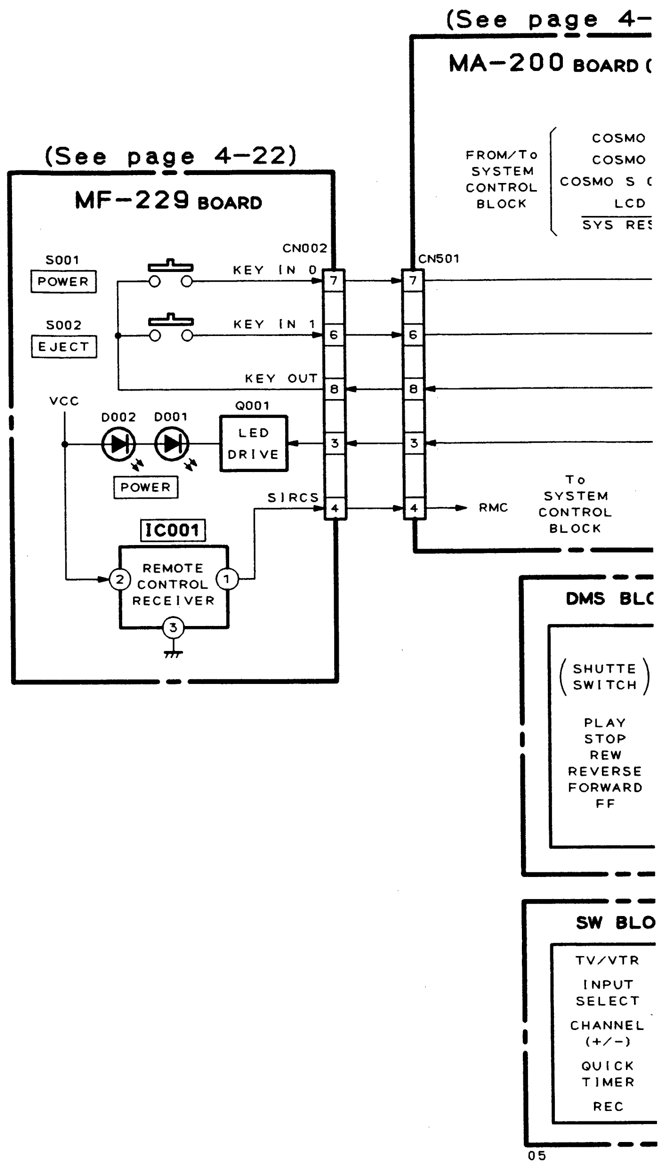
3-4. AUDIO BLOCK DIAGRAM

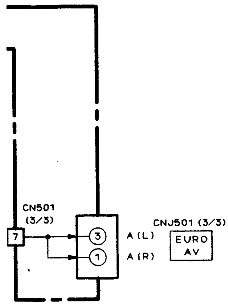

EU-1 BOARD (2/2) (See page 4-21)
CNJ501 (2/3)
EURO AV
A (L)
A (R)
CN501 (2/3)
CN703 (2/3)
FROM TU BLOCK
TU A
CN303
BIAS (−)
BIAS (+)
CHECK PIN
IC301
PB/REC AMP. SWITCH
CN302
A HEAD (X)
AUDIO REC/PB HEAD
A HEAD (Y)
RV301
BIAS ADJ
Q301
T301
BIAS/ERASE OSC
Q302.303
VCC
A ERASE HEAD
AUDIO ERASE HEAD
CN301
FE HEAD
FULL ERASE HEAD
05
TU A
To TU BLOCK
CN703 (3/3)
CN501 (3/3)
CNJ501 (3/3)
A (L)
A (R)
EURO AV
Q304, 305
MUTE
MUTE
D301
LINE 1
NA PB
D302
SP
NA REC P̄
FROM SYSTEM CONTROL BLOCK
MA-200 BOARD (3/5)
(See page 4-17)

3-5. TUNER BLOCK DIAGRAM


MA-200 BOARD
(See page 4-17)
TU 701
TUNER BLOCK
BB +5V
MB +5V
RF IN
Q1
RF AMP
Q2
BUFFER
IC1
RF MODU
FROM VIDEO BLOCK
TU V
VIDEO
FROM AUDIO BLOCK
TU A
AUDIO
RF
RF OUT
IC102
PLL
X101
X
OUT
IN
HF
ONLY
BTL +30V
BPL +5V
PLL CLOCK
PLL DATA
PLL ENABLE
CLK
DAT
EN
U
H
L
FROM/To SYSTEM CONTROL BLOCK
SW 1
AFT
DT101
DT105
DT106
DT112
DT113
Q101
MIX AMP
Q102
MIX AMP
Q103
MIX AMP
DT102
DT103
DT109
DT116
IC101
MIX OSC
X201
IC201
VIF
VIF
VIF
VIDEO
RF AGC
X205
X204
X202
X203
D203
VIDEO
SIF
AFT
VIDEO
AUDIO
Q201
VIDEO BUFFER
TU V
To VIDEO BLOCK
TU A
To AUDIO BLOCK
Q202
SWITCH
05

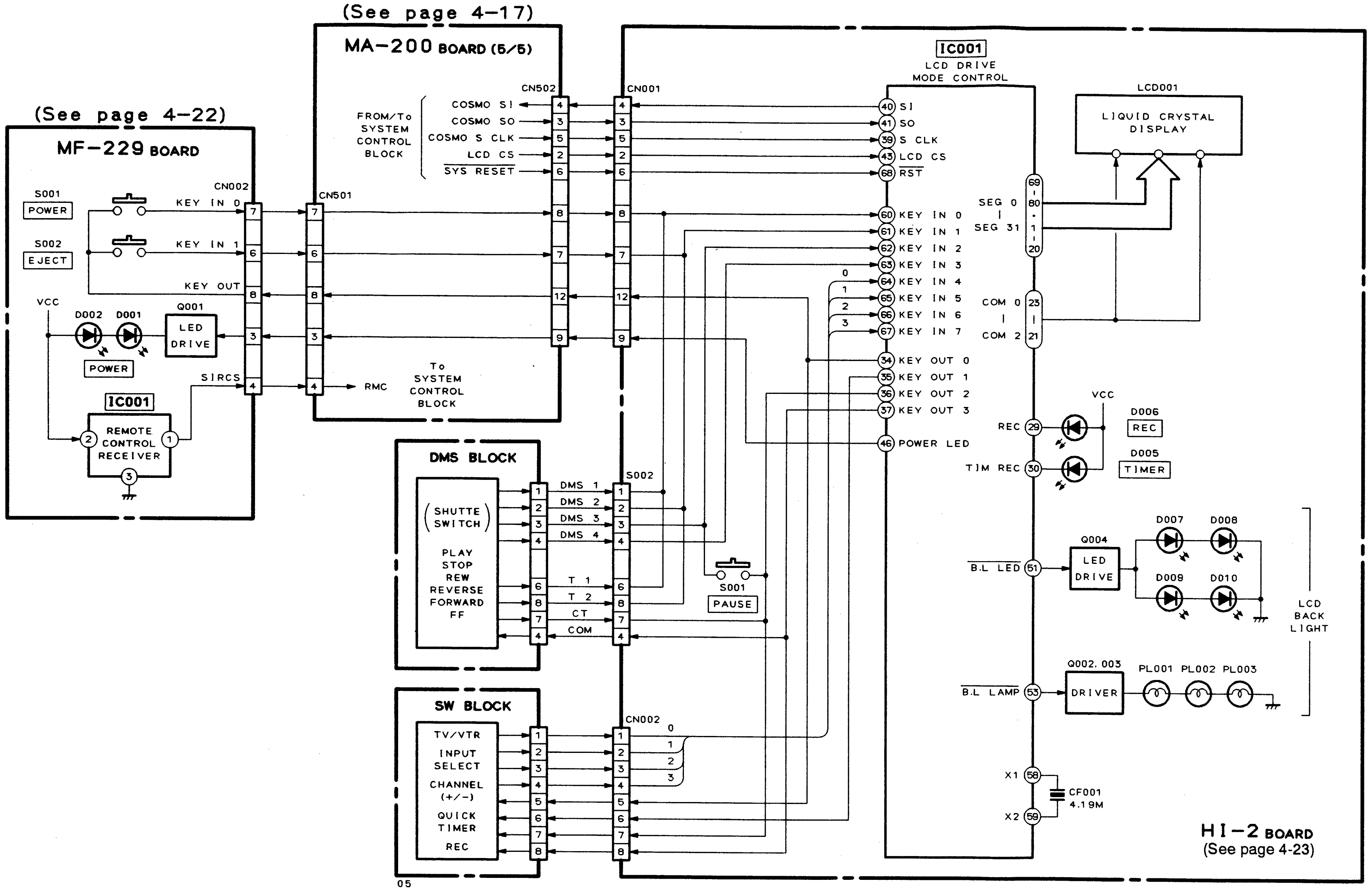
3-6. MODE CONTROL BLOCK DIAGRAM


(See page 4-22)
MF-229 BOARD
S001
POWER
S002
EJECT
CN002
KEY IN 0
KEY IN 1
KEY OUT
VCC
D002
D001
POWER
Q001
LED DRIVE
SIRCS
IC001
REMOTE CONTROL RECEIVER
(See page 4-
MA-200 BOARD (
FROM/To SYSTEM CONTROL BLOCK
COSMO
COSMO
COSMO S (
LCD
SYS RES
CN501
RMC
To SYSTEM CONTROL BLOCK
DMS BLC
SHUTTE SWITCH
PLAY
STOP
REW
REVERSE
FORWARD
FF
SW BLO
TV/VTR
INPUT SELECT
CHANNEL (+/−)
QUICK TIMER
REC
05

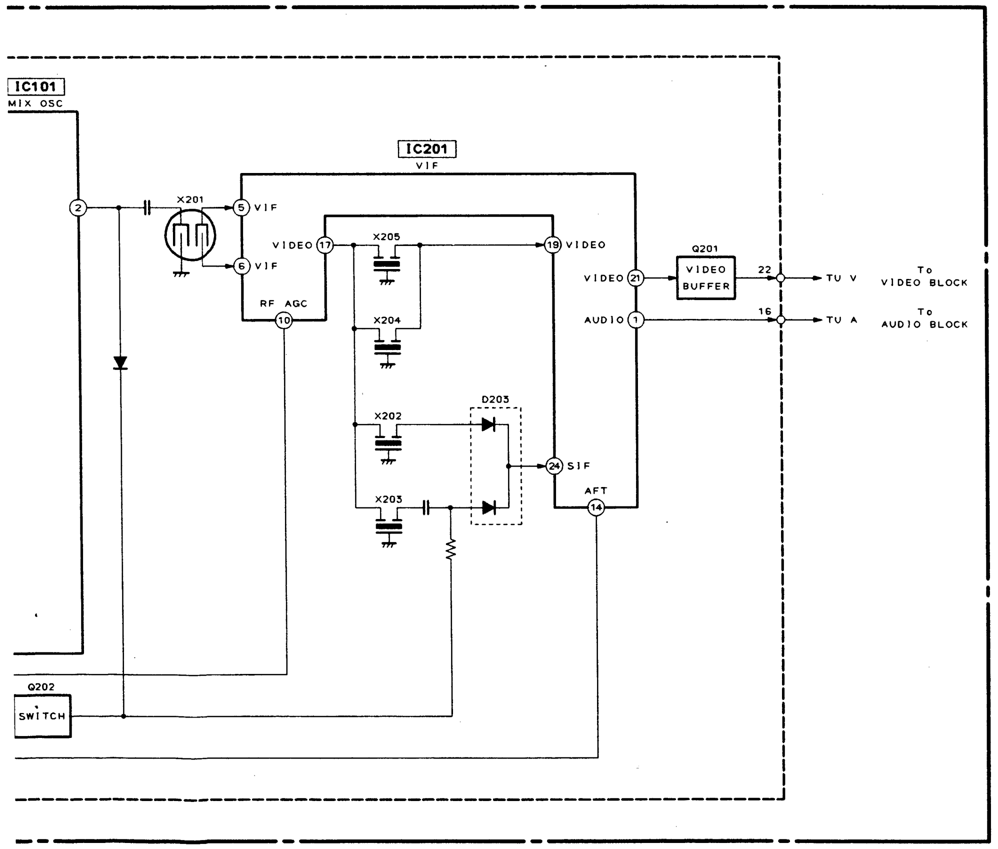


CN501 (3/3)
7
3
1
A (L)
A (R)
CNJ501 (3/3)
EURO AV

3-6. MODE CONTROL BLOCK DIAGRAM

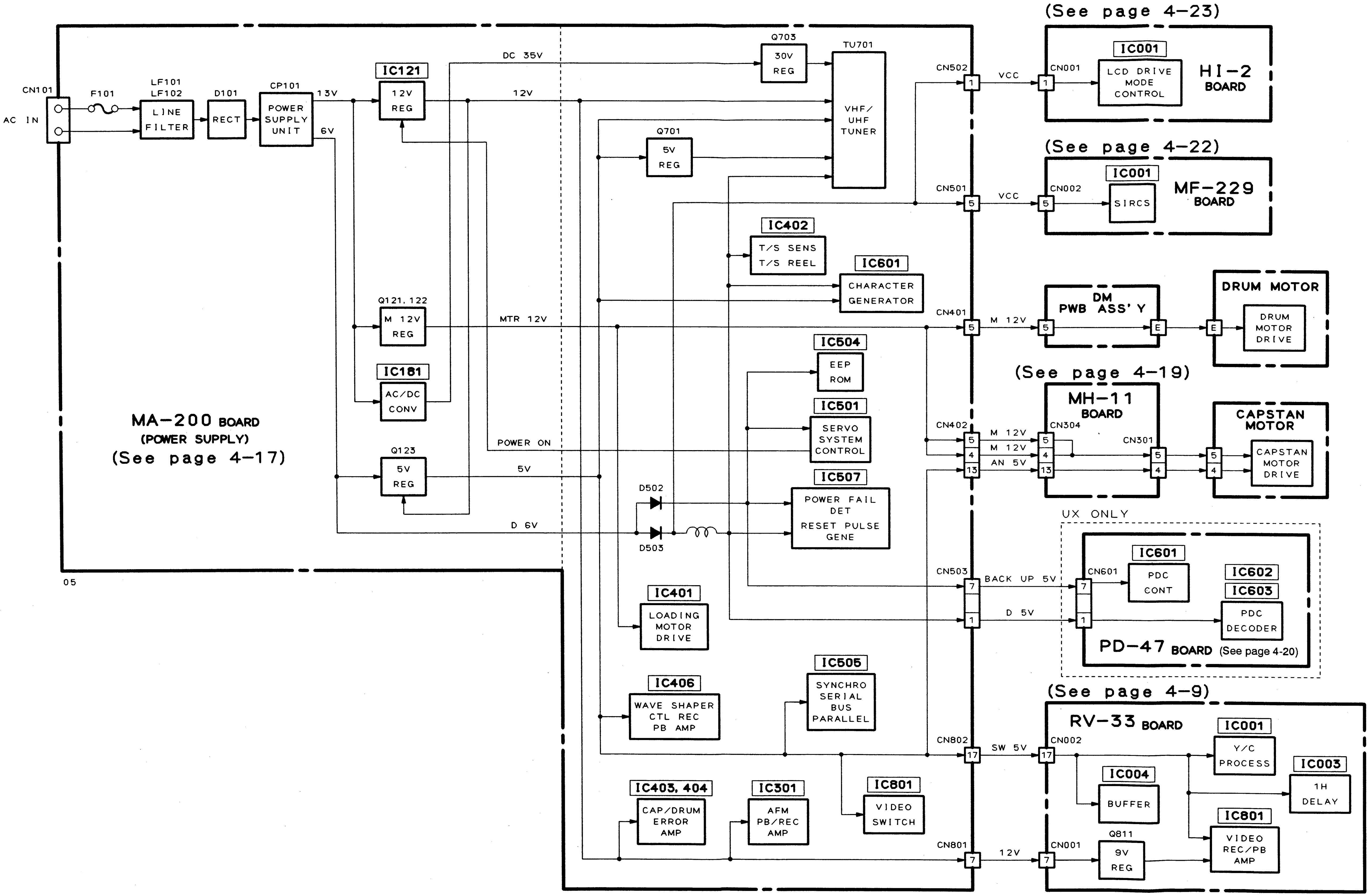


(See page 4-22)
MF-229 BOARD
S001
POWER
S002
EJECT
CN002
KEY IN 0
KEY IN 1
KEY OUT
VCC
D002
D001
Q001
LED DRIVE
POWER
SIRCS
IC001
REMOTE CONTROL RECEIVER
(See page 4-17)
MA-200 BOARD (5/5)
CN502
FROM/To SYSTEM CONTROL BLOCK
COSMO SI
COSMO SO
COSMO S CLK
LCD CS
SYS RESET
CN501
RMC
To SYSTEM CONTROL BLOCK
DMS BLOCK
SHUTTE SWITCH
PLAY
STOP
REW
REVERSE
FORWARD
FF
DMS 1
DMS 2
DMS 3
DMS 4
T 1
T 2
CT
COM
S002
S001
PAUSE
SW BLOCK
TV/VTR
INPUT SELECT
CHANNEL (+/-)
QUICK TIMER
REC
CN002
05
CN001
IC001
LCD DRIVE MODE CONTROL
SI
SO
S CLK
LCD CS
RST
KEY IN 0
KEY IN 1
KEY IN 2
KEY IN 3
KEY IN 4
KEY IN 5
KEY IN 6
KEY IN 7
KEY OUT 0
KEY OUT 1
KEY OUT 2
KEY OUT 3
POWER LED
SEG 0
SEG 31
COM 0
COM 2
REC
TIM REC
B.L LED
B.L LAMP
X1
X2
LCD001
LIQUID CRYSTAL DISPLAY
VCC
D006
REC
D005
TIMER
Q004
LED DRIVE
D007
D008
D009
D010
LCD BACK LIGHT
Q002, 003
DRIVER
PL001
PL002
PL003
CF001
4.19M
HI-2 BOARD
(See page 4-23)



IC101
MIX OSC
IC201
VIF
X201
VIF
VIF
VIDEO
VIDEO
RF AGC
X205
X204
X202
X203
D203
SIF
AFT
VIDEO
AUDIO
Q201
VIDEO BUFFER
22
16
TU V
TU A
To VIDEO BLOCK
To AUDIO BLOCK
Q202
SWITCH

3-7. POWER SUPPLY BLOCK DIAGRAM


(See page 4-23)
(See page 4-22)
(See page 4-19)
(See page 4-9)
(See page 4-17)
MA-200 BOARD
(POWER SUPPLY)
05
CN101
AC IN
F101
LF101
LF102
LINE FILTER
D101
RECT
CP101
POWER SUPPLY UNIT
13V
6V
IC121
12V REG
DC 35V
12V
Q703
30V REG
TU701
VHF/UHF TUNER
Q701
5V REG
IC402
T/S SENS
T/S REEL
IC601
CHARACTER GENERATOR
Q121, 122
M 12V REG
MTR 12V
IC181
AC/DC CONV
IC504
EEP ROM
IC501
SERVO SYSTEM CONTROL
POWER ON
Q123
5V REG
5V
IC507
POWER FAIL DET
RESET PULSE GENE
D502
D503
D 6V
IC401
LOADING MOTOR DRIVE
IC406
WAVE SHAPER
CTL REC
PB AMP
IC505
SYNCHRO SERIAL BUS PARALLEL
IC403, 404
CAP/DRUM ERROR AMP
IC301
AFM PB/REC AMP
IC801
VIDEO SWITCH
CN502
1
VCC
CN501
5
CN401
M 12V
CN402
M 12V
AN 5V
4
13
CN503
7
BACK UP 5V
D 5V
CN802
17
SW 5V
CN801
12V
HI-2 BOARD
CN001
IC001
LCD DRIVE MODE CONTROL
MF-229 BOARD
CN002
IC001
SIRCS
DM PWB ASS'Y
E
DRUM MOTOR
DRUM MOTOR DRIVE
MH-11 BOARD
CN304
CN301
CAPSTAN MOTOR
CAPSTAN MOTOR DRIVE
UX ONLY
CN601
IC601
PDC CONT
IC602
IC603
PDC DECODER
PD-47 BOARD (See page 4-20)
RV-33 BOARD
CN002
IC001
Y/C PROCESS
IC004
BUFFER
IC003
1H DELAY
CN001
Q811
9V REG
IC801
VIDEO REC/PB AMP

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For printed wiring boards:
- ○——— : indicates a lead wire mounted on the component side.
- •——— : indicates a lead wire mounted on the printed side.
- ○ : Through hole.
- ■ : Parts mounted on the conductor side.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.*
- Circled numbers refer to waveforms.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

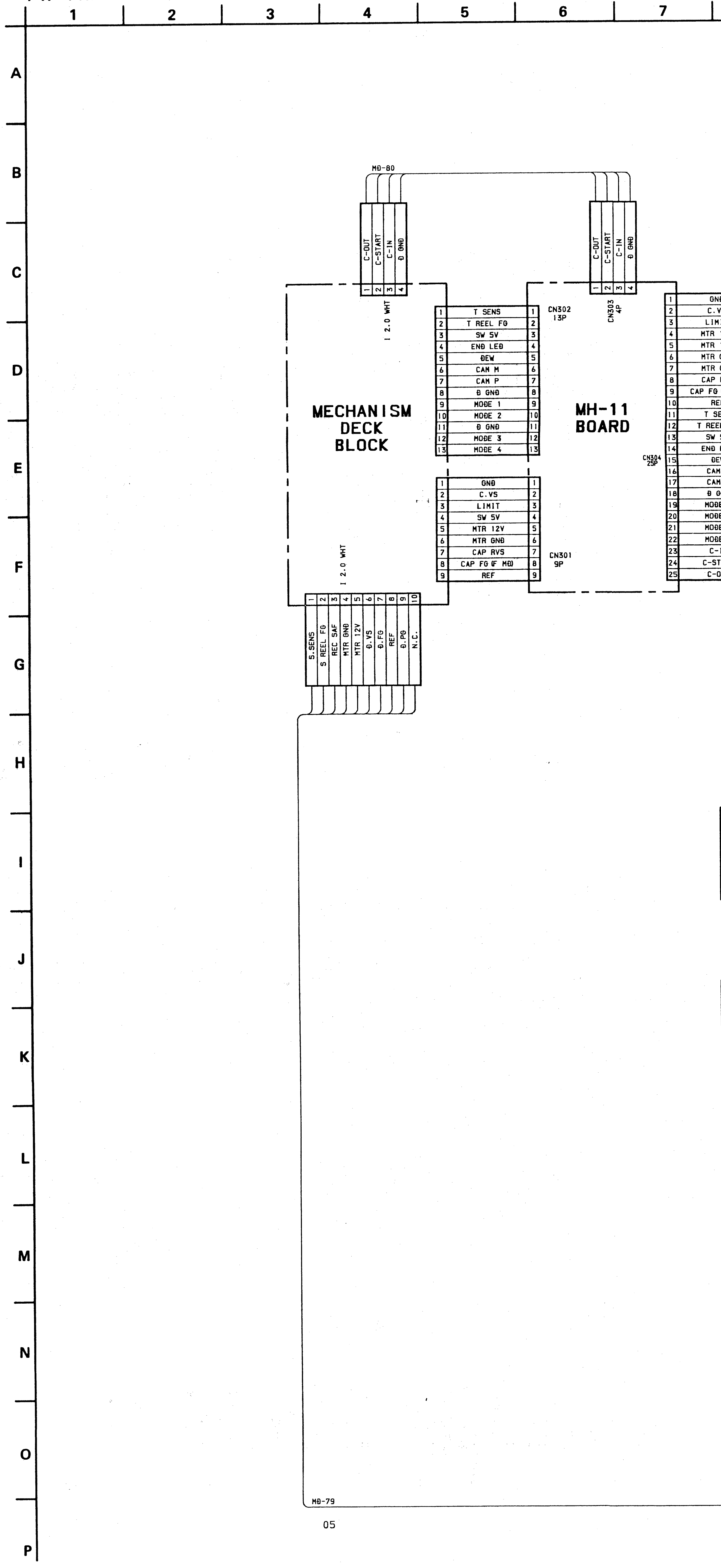
For schematic diagram:
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W (Chip resistors: 1/10W) unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repair.*
- ━━━ : B + Line.*
- ━ ━ ━ : B − Line.*
- ⇨ : IN/OUT direction of B line (+ , −).*
- Circled numbers refer to waveforms.*
- Voltages are dc between measurement point.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

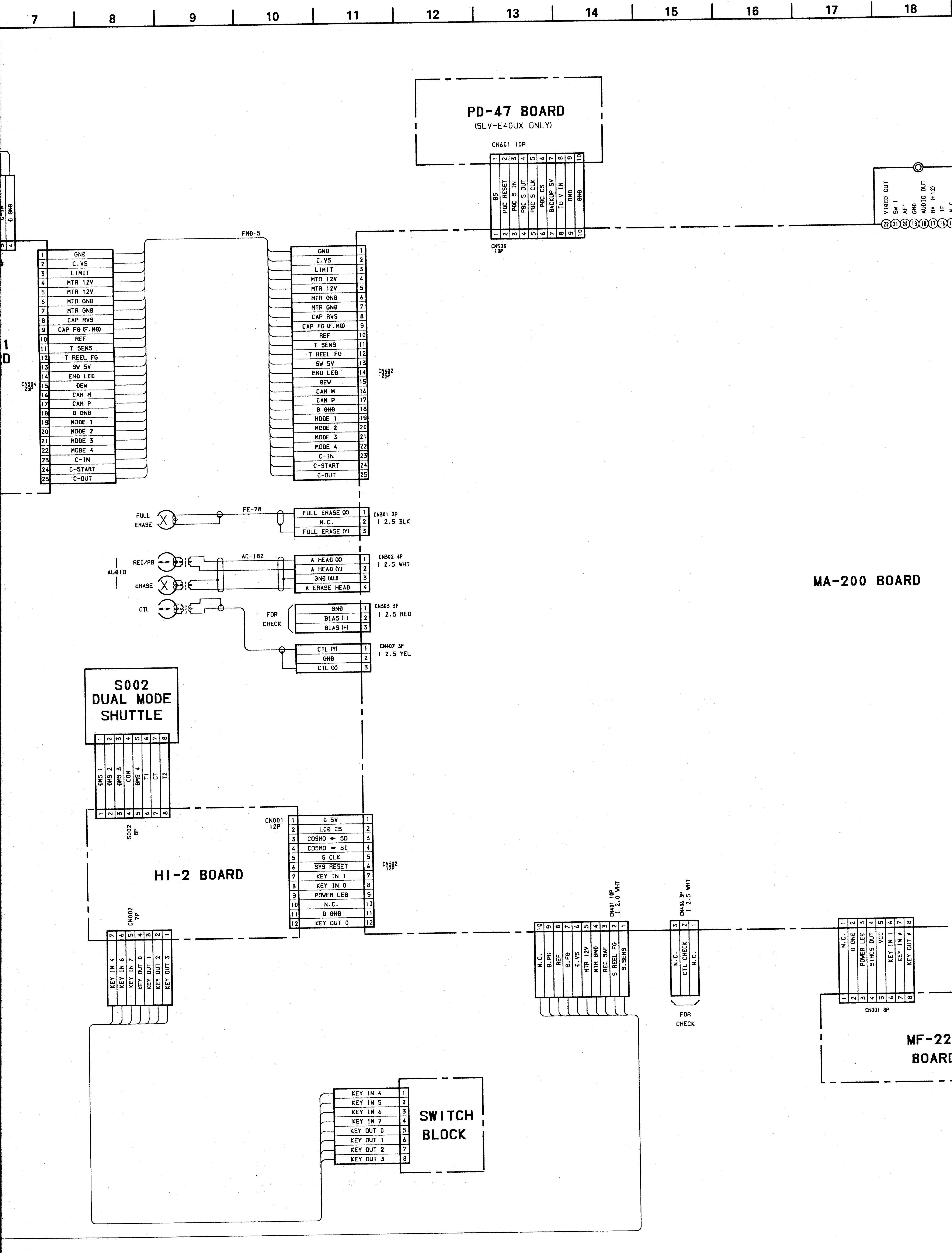
> **Note:** The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
> Replace only with part number specified.

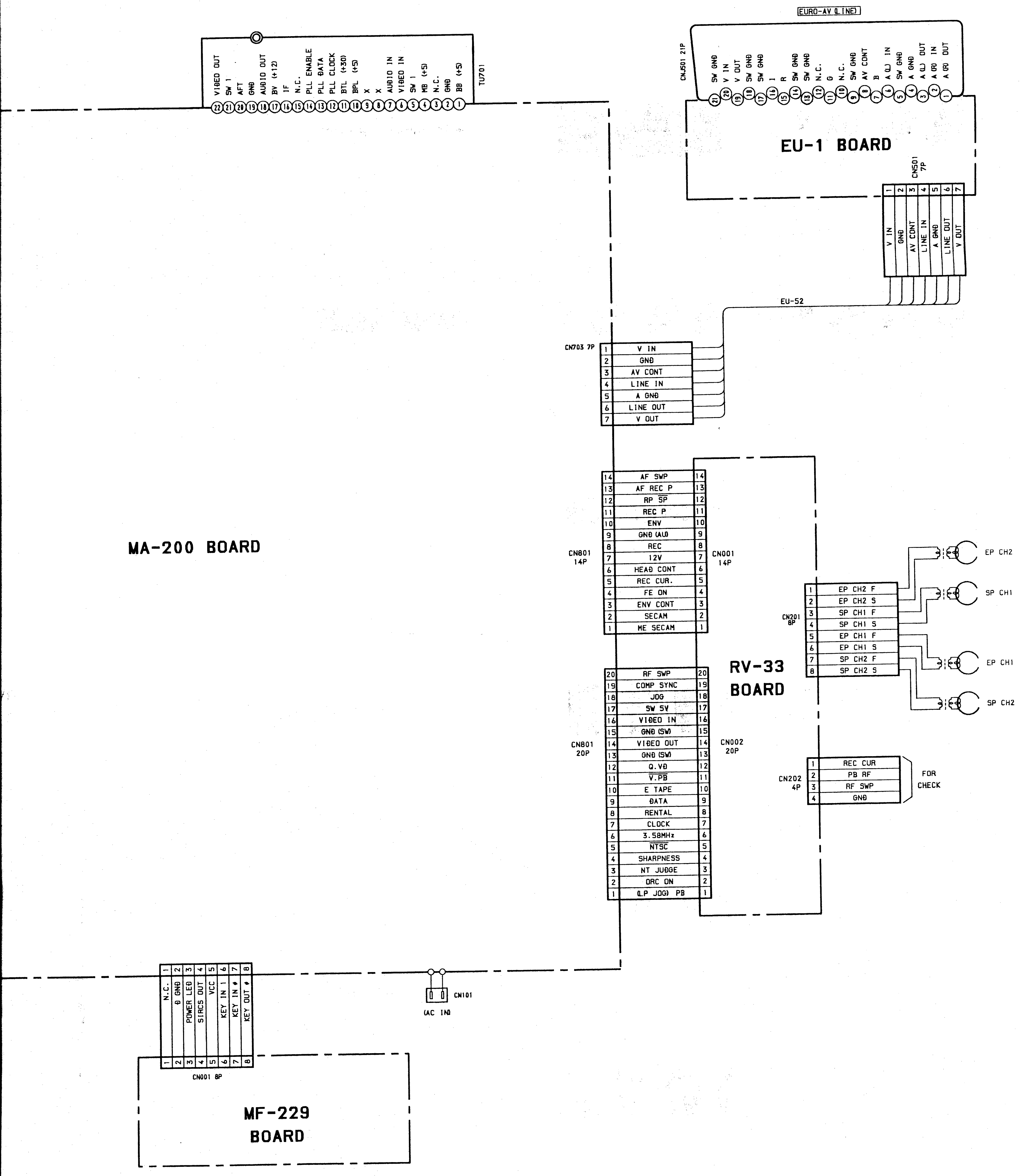
> When indicating parts by reference number, please include the board name.

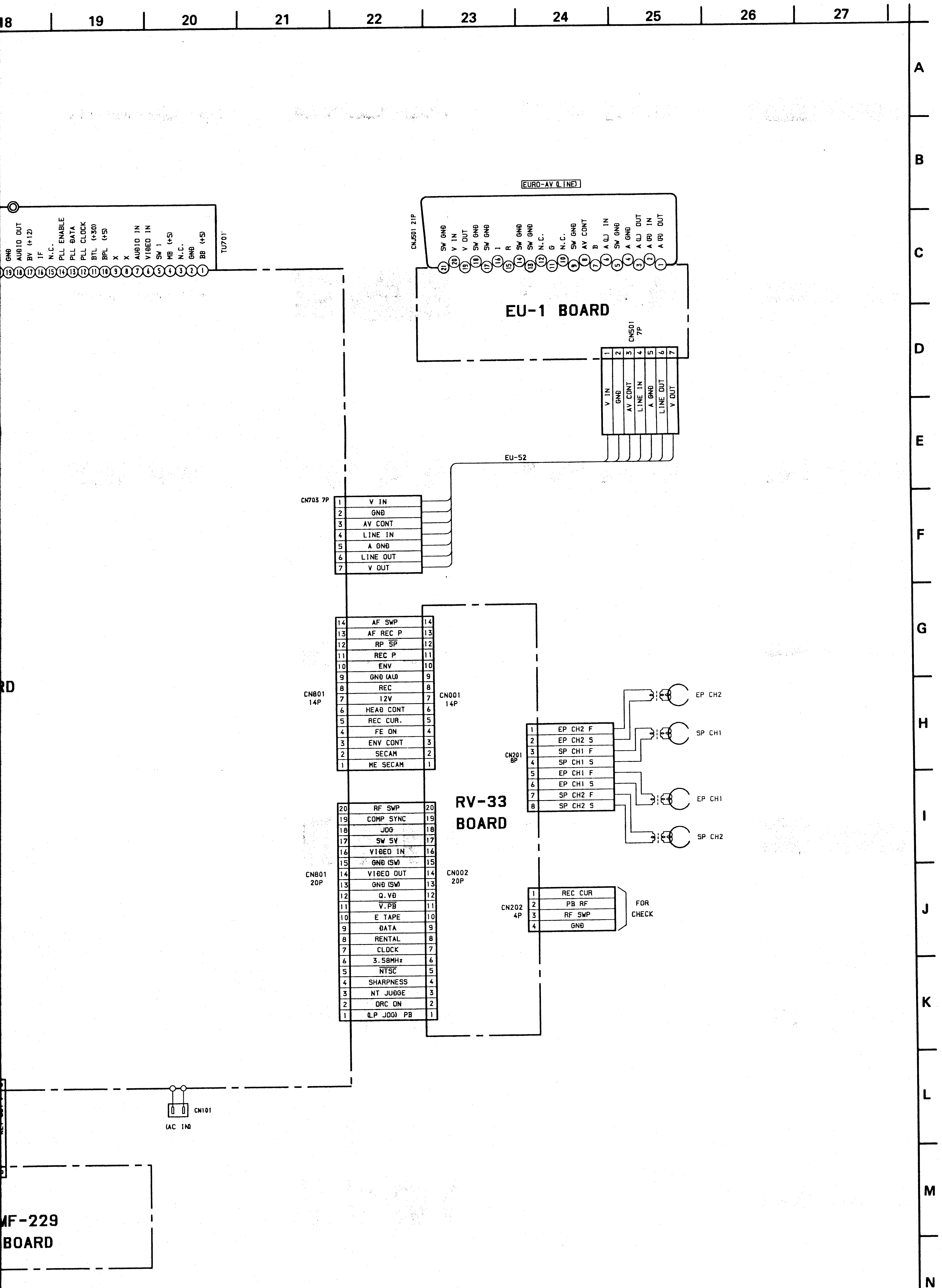
- * : indicated by the color red.

4-1. FRAME SCHEMATIC DIAGRAM


1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
MD-80
C-OUT
C-START
C-IN
Ð GND
I 2.0 WHT
MECHANISM DECK BLOCK
T SENS
T REEL FG
SW 5V
END LED
DEW
CAM M
CAM P
Ð GND
MODE 1
MODE 2
Ð GND
MODE 3
MODE 4
CN302 13P
CN303 4P
MH-11 BOARD
CN304 25P
GND
C.VS
LIMIT
SW 5V
MTR 12V
MTR GND
CAP RVS
CAP FG (F MD)
REF
CN301 9P
I 2.0 WHT
S.SENS
S REEL FG
REC SAF
MTR GND
MTR 12V
Ð.VS
Ð.FG
REF
Ð.PG
N.C.
MD-79
05


7
8
9
10
11
12
13
14
15
16
17
18
PD-47 BOARD
(SLV-E40UX ONLY)
CN601 10P
Ð5
PÐC RESET
PÐC S IN
PÐC S OUT
PÐC S CLK
PÐC CS
BACKUP 5V
TU V IN
GNÐ
GNÐ
CN503 10P
VIÐEO OUT
SW 1
AFT
GNÐ
AUDIO OUT
BV (+12)
IF
C-IN
Ð GNÐ
FMÐ-5
GNÐ
C.VS
LIMIT
MTR 12V
MTR 12V
MTR GNÐ
MTR GNÐ
CAP RVS
CAP FG (F.MÐ)
REF
T SENS
T REEL FG
SW 5V
ENÐ LEÐ
ÐEW
CAM M
CAM P
Ð GNÐ
MODE 1
MODE 2
MODE 3
MODE 4
C-IN
C-START
C-OUT
CN304 25P
CN402 25P
FULL ERASE
FE-78
FULL ERASE (X)
N.C.
FULL ERASE (Y)
CN301 3P I 2.5 BLK
AUDIO
REC/PB
ERASE
AC-182
A HEAÐ (X)
A HEAÐ (Y)
GNÐ (AU)
A ERASE HEAÐ
CN302 4P I 2.5 WHT
CTL
FOR CHECK
GNÐ
BIAS (-)
BIAS (+)
CN303 3P I 2.5 REÐ
CTL (Y)
GNÐ
CTL (X)
CN407 3P I 2.5 YEL
MA-200 BOARD
S002 DUAL MODE SHUTTLE
ÐMS 1
ÐMS 2
ÐMS 3
COM
ÐMS 4
T1
CT
T2
S002 8P
HI-2 BOARD
CN001 12P
Ð 5V
LCÐ CS
COSMO ← SO
COSMO → SI
S CLK
SYS RESET
KEY IN 1
KEY IN 0
POWER LEÐ
N.C.
Ð GNÐ
KEY OUT 0
CN502 12P
CN002 7P
KEY IN 4
KEY IN 6
KEY IN 7
KEY OUT 0
KEY OUT 1
KEY OUT 2
KEY OUT 3
CN401 10P I 2.0 WHT
N.C.
Ð.PG
REF
Ð.FÐ
Ð.VS
MTR 12V
MTR GNÐ
REC SAF
S REEL FG
S.SENS
CN406 3P I 2.5 WHT
N.C.
CTL CHECK
N.C.
FOR CHECK
N.C.
Ð GNÐ
POWER LEÐ
SIRCS OUT
VCC
KEY IN 1
KEY IN #
KEY OUT #
CN001 8P
MF-22
BOARD
KEY IN 4
KEY IN 5
KEY IN 6
KEY IN 7
KEY OUT 0
KEY OUT 1
KEY OUT 2
KEY OUT 3
SWITCH BLOCK

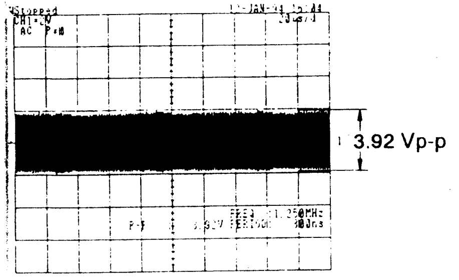

EURO-AV (LINE)
CNJ501 21P
21 SW GND
20 V IN
19 V OUT
18 SW GND
17 SW GND
16 I
15 R
14 SW GND
13 SW GND
12 N.C.
11 G
10 N.C.
9 SW GND
8 AV CONT
7 B
6 A (L) IN
5 SW GND
4 A GND
3 A (L) OUT
2 A (R) IN
1 A (R) OUT
EU-1 BOARD
CN501 7P
1 V IN
2 GND
3 AV CONT
4 LINE IN
5 A GND
6 LINE OUT
7 V OUT
EU-52
TU701
22 VIDEO OUT
21 SW 1
20 AFT
19 GND
18 AUDIO OUT
17 BV (+12)
16 IF
15 N.C.
14 PLL ENABLE
13 PLL DATA
12 PLL CLOCK
11 BTL (+30)
10 BPL (+5)
9 X
8 X
7 AUDIO IN
6 VIDEO IN
5 SW 1
4 MB (+5)
3 N.C.
2 GND
1 BB (+5)
CN703 7P
1 V IN
2 GND
3 AV CONT
4 LINE IN
5 A GND
6 LINE OUT
7 V OUT
MA-200 BOARD
CN801 14P
CN001 14P
14 AF SWP 14
13 AF REC P 13
12 RP SP 12
11 REC P 11
10 ENV 10
9 GND (AU) 9
8 REC 8
7 12V 7
6 HEAD CONT 6
5 REC CUR. 5
4 FE ON 4
3 ENV CONT 3
2 SECAM 2
1 ME SECAM 1
RV-33 BOARD
CN801 20P
CN002 20P
20 RF SWP 20
19 COMP SYNC 19
18 JOG 18
17 SW 5V 17
16 VIDEO IN 16
15 GND (SW) 15
14 VIDEO OUT 14
13 GND (SW) 13
12 Q.VD 12
11 V.PB 11
10 E TAPE 10
9 DATA 9
8 RENTAL 8
7 CLOCK 7
6 3.58MHz 6
5 NTSC 5
4 SHARPNESS 4
3 NT JUDGE 3
2 ORC ON 2
1 (LP JOG) PB 1
CN201 8P
1 EP CH2 F
2 EP CH2 S
3 SP CH1 F
4 SP CH1 S
5 EP CH1 F
6 EP CH1 S
7 SP CH2 F
8 SP CH2 S
EP CH2
SP CH1
EP CH1
SP CH2
CN202 4P
1 REC CUR
2 PB RF
3 RF SWP
4 GND
FOR CHECK
CN101
(AC IN)
1 N.C.
2 D GND
3 POWER LED
4 SIRCS OUT
5 VCC
6 KEY IN 1
7 KEY IN Ø
8 KEY OUT Ø
CN001 8P
MF-229 BOARD


18
19
20
21
22
23
24
25
26
27
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
TU701
19 GND
18 AUDIO OUT
17 BV (+12)
16 IF
15 N.C.
14 PLL ENABLE
13 PLL DATA
12 PLL CLOCK
11 BTL (+30)
10 BPL (+5)
9 X
8 X
7 AUDIO IN
6 VIDEO IN
5 SW 1
4 MB (+5)
3 N.C.
2 GND
1 BB (+5)
EURO-AV (LINE)
CNJ501 21P
21 SW GND
20 V IN
19 V OUT
18 SW GND
17 SW GND
16 I
15 R
14 SW GND
13 SW GND
12 N.C.
11 G
10 N.C.
9 SW GND
8 AV CONT
7 B
6 A (L) IN
5 SW GND
4 A GND
3 A (L) OUT
2 A (R) IN
1 A (R) OUT
EU-1 BOARD
CN501 7P
1 V IN
2 GND
3 AV CONT
4 LINE IN
5 A GND
6 LINE OUT
7 V OUT
EU-52
CN703 7P
1 V IN
2 GND
3 AV CONT
4 LINE IN
5 A GND
6 LINE OUT
7 V OUT
CN801 14P
CN001 14P
14 AF SWP
13 AF REC P
12 RP SP
11 REC P
10 ENV
9 GND (AU)
8 REC
7 12V
6 HEAD CONT
5 REC CUR.
4 FE ON
3 ENV CONT
2 SECAM
1 ME SECAM
RD
CN801 20P
CN002 20P
20 RF SWP
19 COMP SYNC
18 JOG
17 SW 5V
16 VIDEO IN
15 GND (SW)
14 VIDEO OUT
13 GND (SW)
12 Q.VD
11 V.PB
10 E TAPE
9 DATA
8 RENTAL
7 CLOCK
6 3.58MHz
5 NTSC
4 SHARPNESS
3 NT JUDGE
2 DRC ON
1 (LP JOG) PB
RV-33
BOARD
CN201 8P
1 EP CH2 F
2 EP CH2 S
3 SP CH1 F
4 SP CH1 S
5 EP CH1 F
6 EP CH1 S
7 SP CH2 F
8 SP CH2 S
EP CH2
SP CH1
EP CH1
SP CH2
CN202 4P
1 REC CUR
2 PB RF
3 RF SWP
4 GND
FOR CHECK
CN101
(AC IN)
MF-229
BOARD

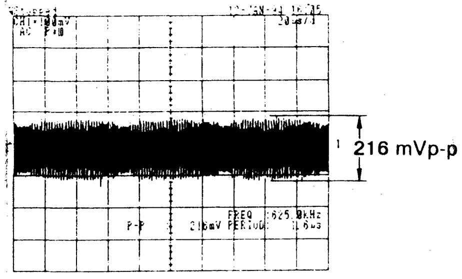
FRAME

RV-33 BOARD

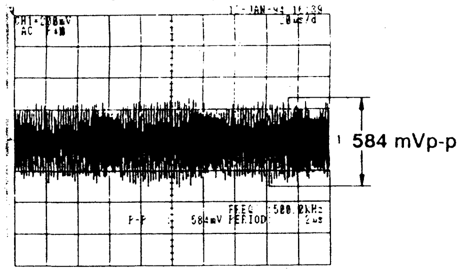
❶ IC801④ REC 20 μsec/DIV



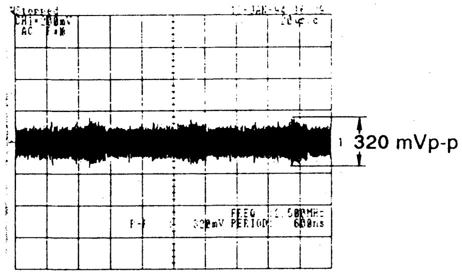
❷ IC801㉙ REC 20 μsec/DIV



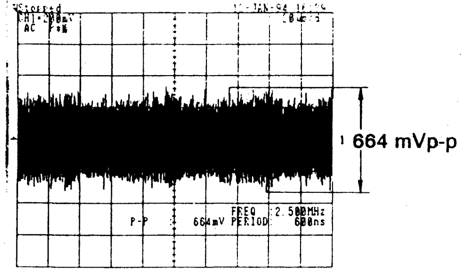
❸ IC801㉓ PB 20 μsec/DIV



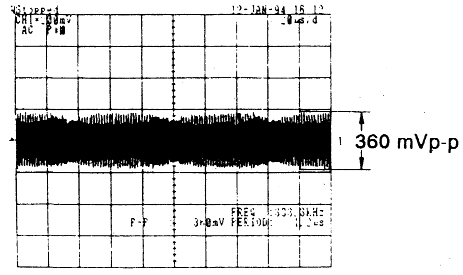
❹ IC801㉕ PB 20 μsec/DIV



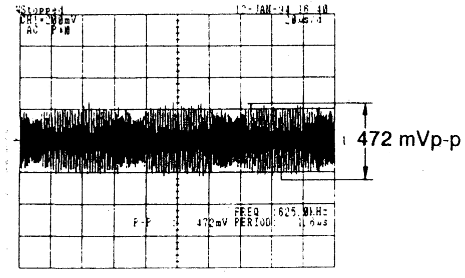
❺ IC801㉗ PB 20 μsec/DIV



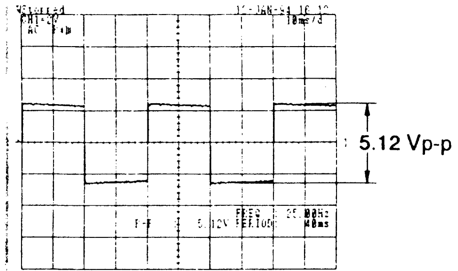
❻ CN802① REC 20 μsec/DIV



❼ CN802② PB 20 μsec/DIV

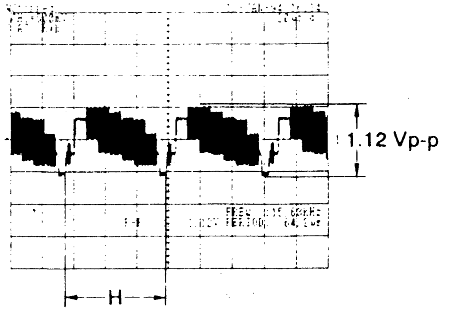


❽ CN802③ REC/PB

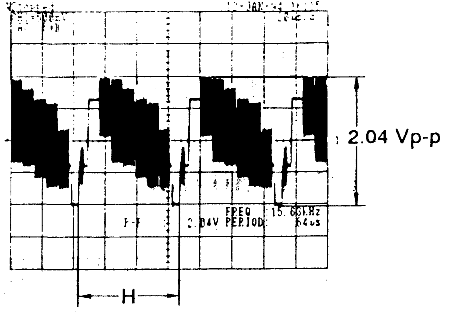


25 Hz

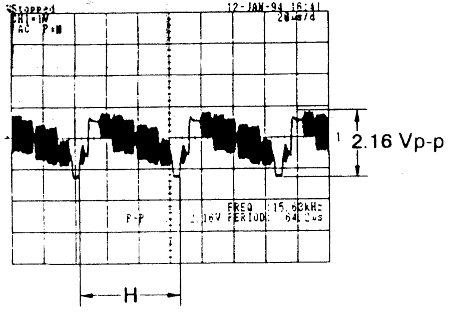
❾ IC001㉖ REC



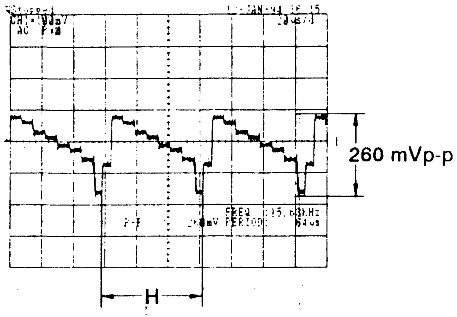
❿ IC001㉘ REC



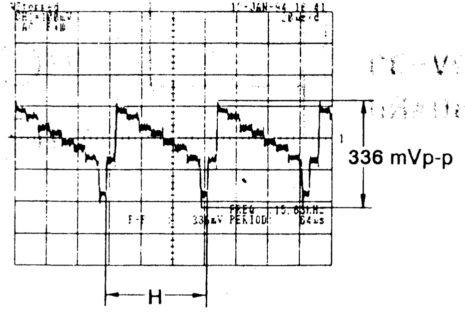
❿ IC001㉘ PB



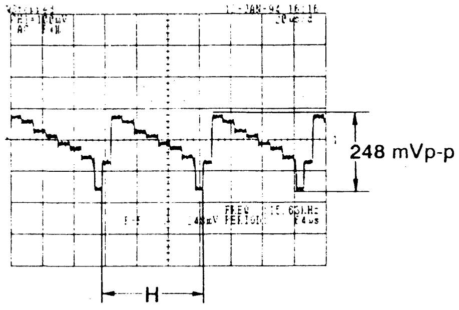
⓫ IC001㉝ REC



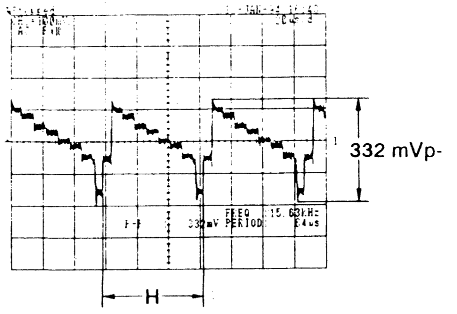
⓫ IC001㉝ PB



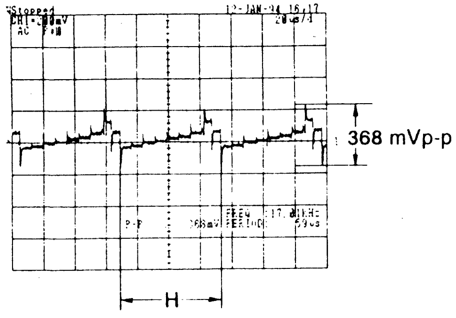
⓬ IC001㉜ REC



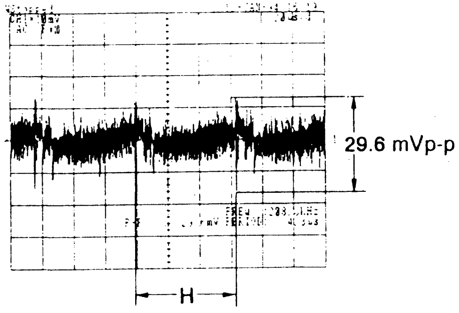
⓬ IC001㉜ PB



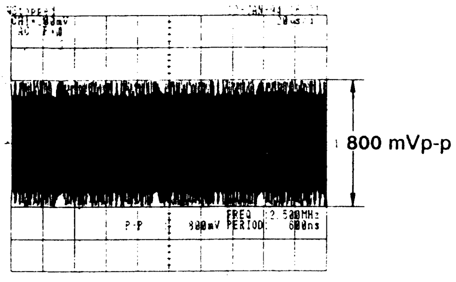
⓭ IC001㊺ REC



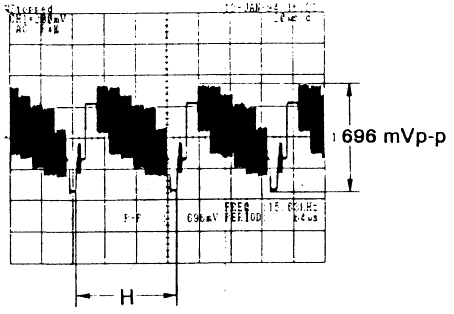
⓮ IC001㊼ REC



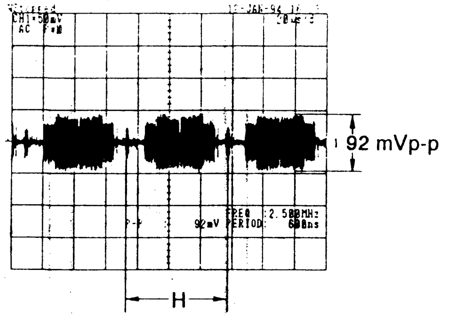
⓯ IC001㊿ REC 20 μsec/DIV



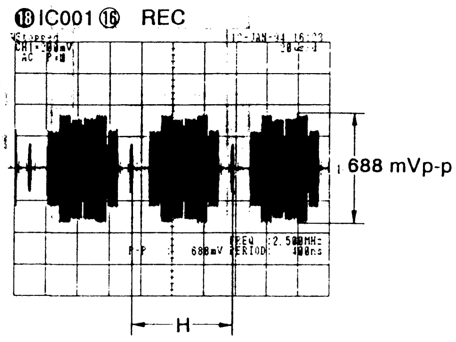
⓰ IC001⑳ REC



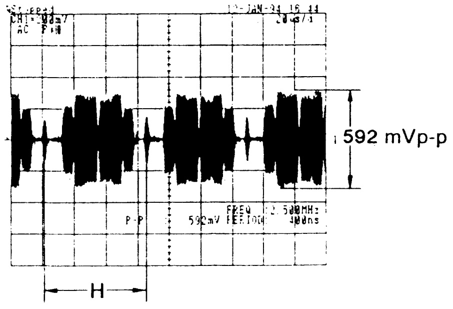
⓱ IC001⑱ REC



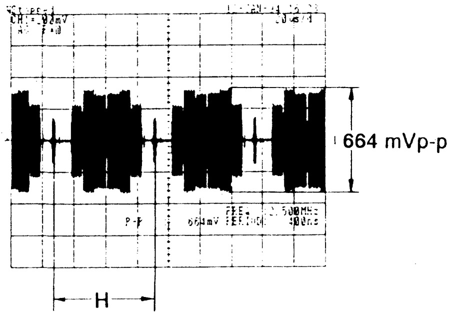
⓲ IC001⑯ REC



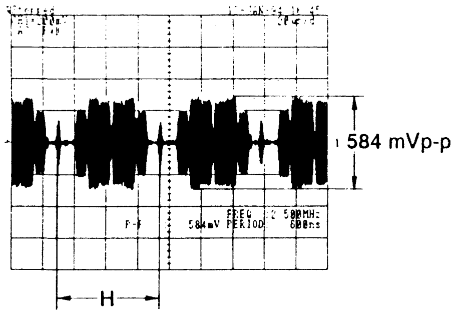
⓲ IC001⑯ PB



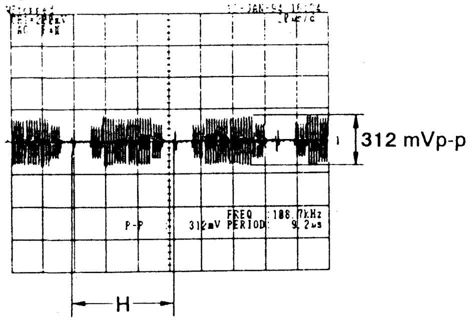
⓳ IC001⑭ REC



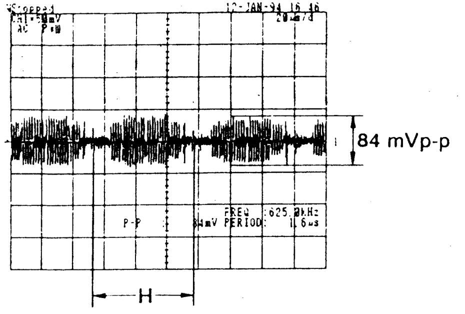
⓳ IC001⑭ PB



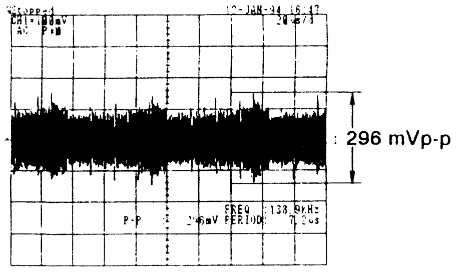
⓴ IC001(53) REC



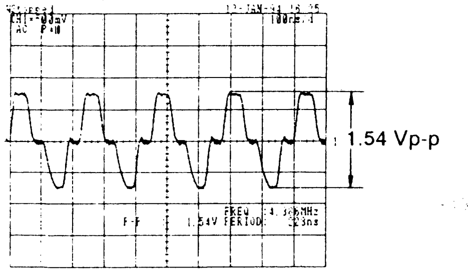
(21) IC001(51) PB



(22) IC001㊸ PB

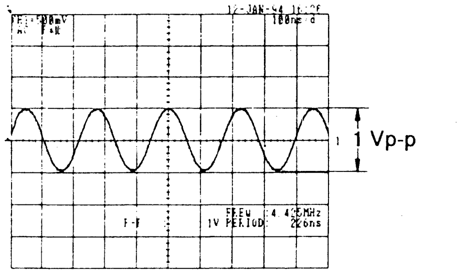


(23) IC001⑥ REC/PB



4.43 MHz

(24) IC001⑦ REC/PB



4.43 MHz

4-2. PRINTED

RV-33 (HEAD AM

– Ref. No.: RV-33 I

- Ther diag

A

B

C

D

E

F

G

H

I

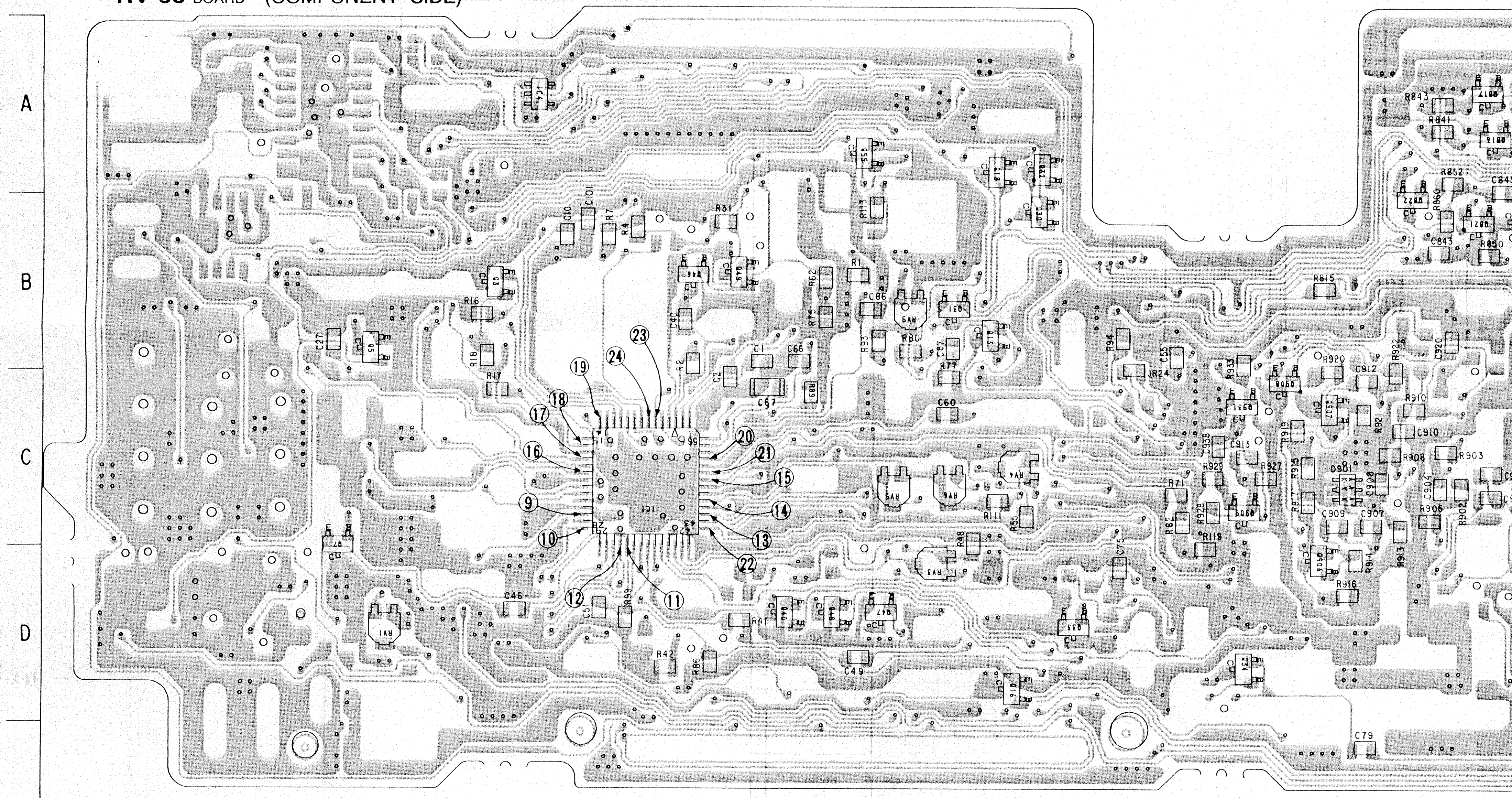
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

(HEAD AMP, VIDEO) PRINTED WIRING BOARD

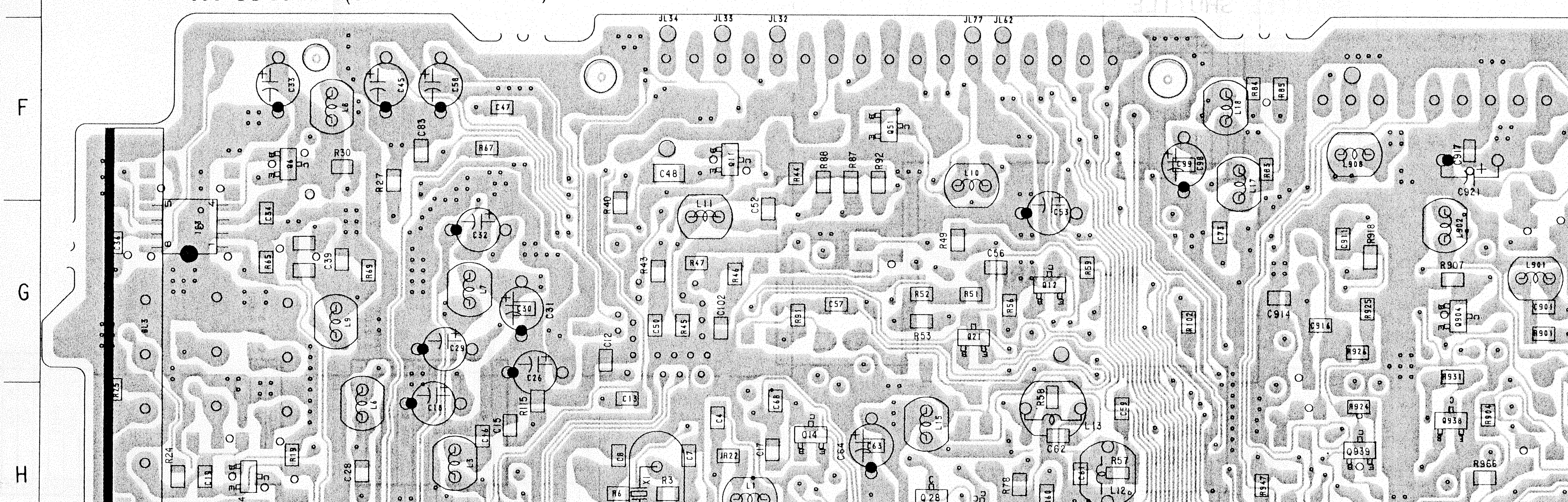
No.: RV-33 Board; 1,000 series –

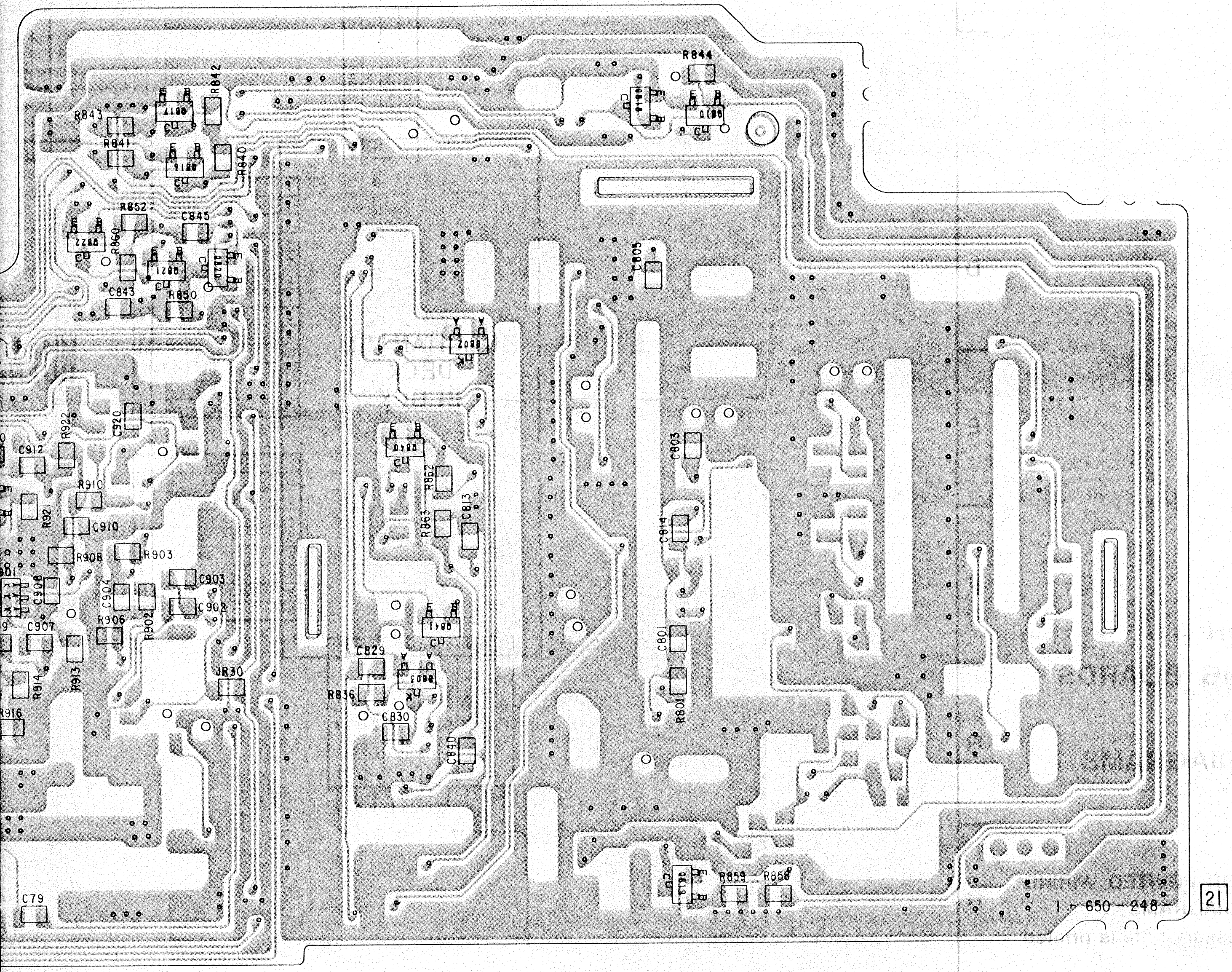
- There is no indication for destination in the printed wiring board diagram.

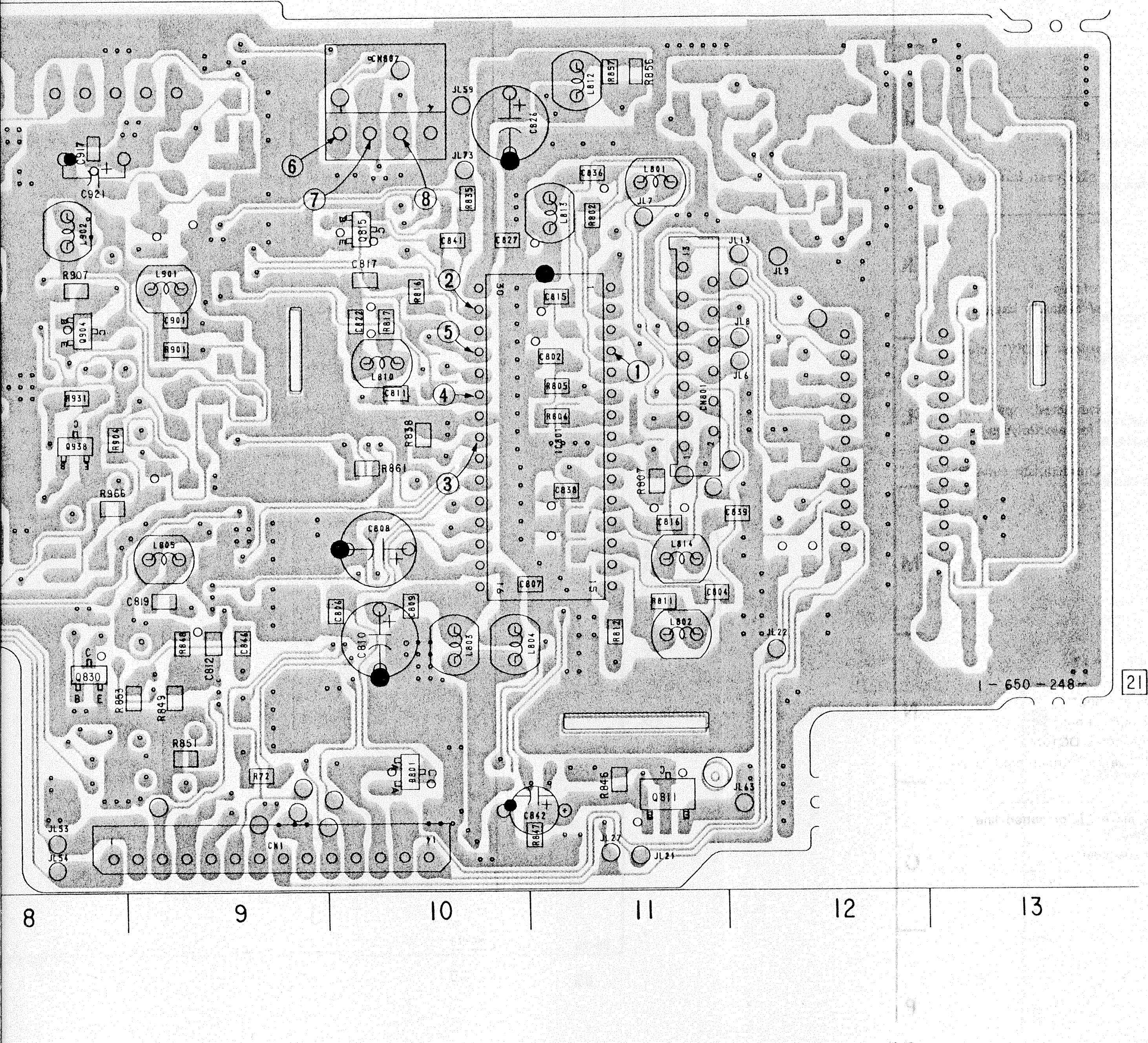
RV-33 BOARD (COMPONENT SIDE)


A
B
C
D
E
IC1
⑨
⑩
⑪
⑫
⑬
⑭
⑮
⑯
⑰
⑱
⑲
⑳
㉑
㉒
㉓
㉔
R843
R841
R852
C843
R850
R815
R31
R4
R7
C10
C101
R113
R16
R17
R18
C27
R2
C1
C66
C67
C60
R77
R80
R93
R94
C55
JR24
R920
C912
R910
C910
R903
R908
C913
R927
R916
R917
D901
C909
C907
R906
R902
C904
R914
R913
R71
R82
R119
R48
R111
R55
C75
C46
C5
R39
R42
R86
R47
C49
C79

RV-33 BOARD (CONDUCTOR SIDE)


F
G
H
I
1
2
3
4
5
6
7
8
05
JL34
JL33
JL32
JL77
JL62
C33
C45
C56
C47
R30
R27
C83
R67
C48
R44
R88
R87
R92
L10
C53
L11
C52
R40
R43
R47
R46
C102
R49
R52
R51
R53
Q21
Q12
R59
R102
C57
L18
R84
R85
L17
C73
C911
R918
R907
L901
C914
C916
R925
R924
R931
R974
Q939
R966
JR15
L805
C819
Q830
R851
JL53
JL54
CN1
JL67
R79
C121
C120
L12
R57
C62
L13
R58
L15
C63
Q28
Q29
R78
C64
C93
C8
C9
R3
X1
R5
R14
R12
R8
R9
Q1
Q2
R10
C5
R35
Q3
C6
C69
JL66
L5
C34
IC1
R24
R19
C19
Q4
C28
L4
L3
C18
C14
C29
C26
C30
C31
C32
L7
L9
C39
R45
R69
R115
C13
C12
C58
C4
C7
JR22
C17
Q14
L1
L2


R844
R842
R843
R841
R840
R852
C845
C843
R850
C805
C803
C920
R922
C912
R910
C910
R908
R903
C903
C902
C904
R906
R902
C907
R913
R914
R916
JR30
R862
R863
C813
C814
C829
R836
C830
C810
C801
R801
C79
R859
R858
1-650-248-
21

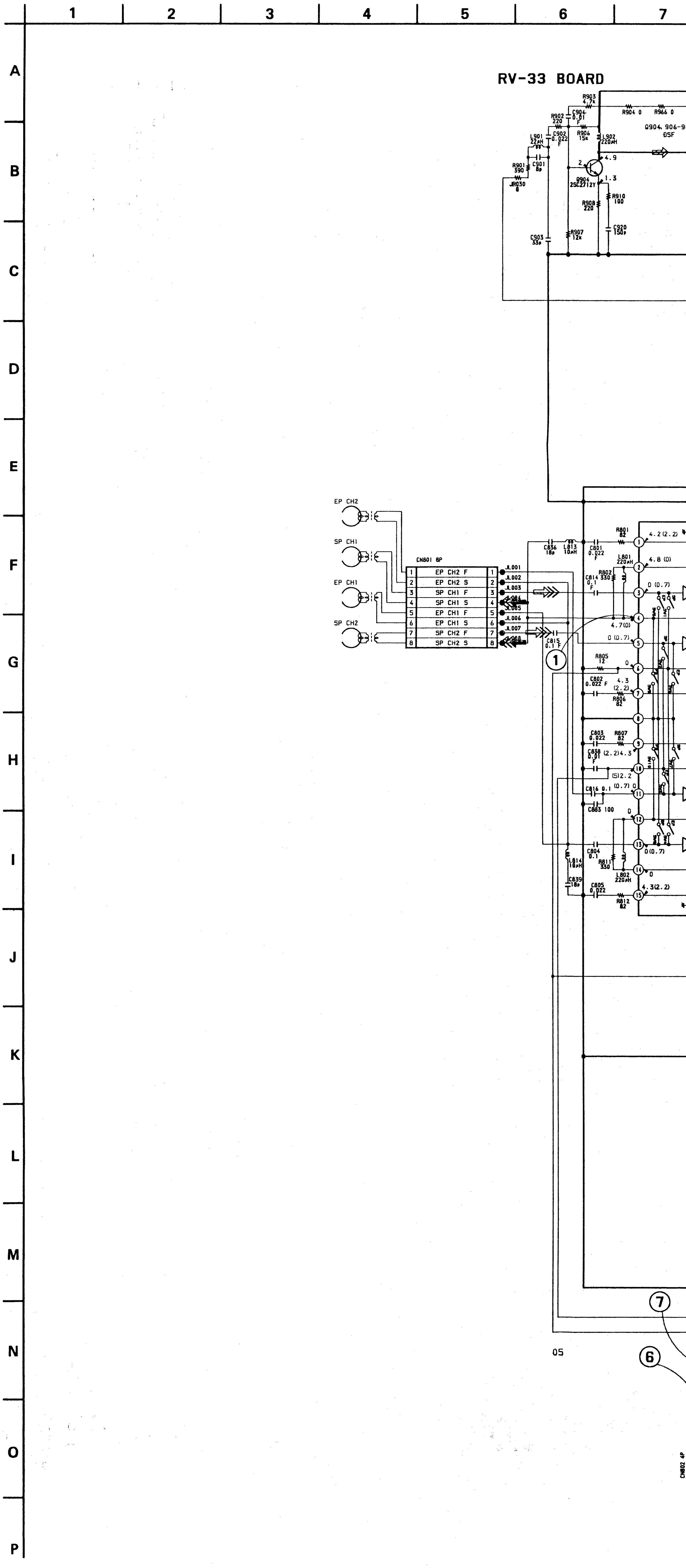

CN802
JL59
R857
R856
C826
L812
C917
C921
6
7
8
JL73
C836
L801
L813
R835
R802
JL7
JL13
JL9
C815
C841
C827
L902
R907
L901
C817
R816
2
C815
C901
R901
C822
R817
5
C802
JL8
1
L810
4
C811
R805
R931
R804
IC801
CN801
JL6
Q938
R838
R861
3
R966
C838
R807
C839
L805
C808
C816
L814
C819
C807
R811
C804
C810
L803
L804
R812
L802
JL22
R843
C812
C844
Q830
R849
R863
R851
R72
R881
R846
Q811
JL63
JL33
JL34
CN1
C842
R847
JL27
JL21
1-650-248-
21
8
9
10
11
12
13

RV-33 BOARD

CN001	I-9
CN002	I-5
CN801	G-11
CN802	F-10
D001	I-3
D801	I-10
D802	B-10
D803	D-10
D901	C-8
IC001	C-4
IC003	G-1
IC004	A-3
IC801	H-11
Q001	I-4
Q002	I-4
Q003	B-3
Q004	H-2
Q005	B-2
Q006	F-2
Q007	C-2
Q011	F-4
Q012	G-6
Q013	B-6
Q014	H-5
Q016	D-6
Q018	A-6
Q021	G-6
Q028	H-5
Q029	H-6
Q030	B-6
Q031	B-6
Q032	A-6
Q033	D-6
Q034	D-7
Q040	D-5
Q041	I-5
Q046	B-4
Q047	D-5
Q048	D-5
Q049	B-4
Q051	F-5
Q055	A-5
Q810	A-11
Q811	I-11
Q815	G-10
Q816	A-9
Q817	A-9
Q818	A-11
Q819	D-11
Q820	B-9
Q821	B-9
Q822	B-8
Q839	I-8
Q840	B-10
Q841	C-10
Q904	G-8
Q906	D-8
Q907	C-8
Q908	C-8
Q909	C-7
Q931	C-7
Q938	H-8
Q939	H-8

RV-33 (HEAD AMP, VIDEO) SCHEMATIC DIAGRAM

– Ref. No.: RV-33 Board; 1,000 series –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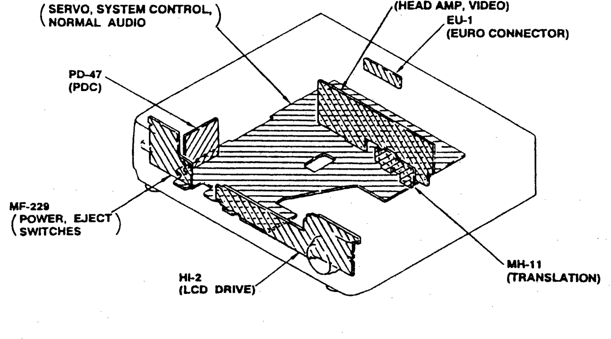
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
RV-33 BOARD
R903 4.7k
R902 220
C904 0.01 F
R904 0
R966 0
Q904, 906-9
05F
L901 22μH
C902 0.022 F
R906 15k
L902 220μH
R901 390
C901 8p
JR030 0
Q904 2SC2712Y
4.9
1.3
R910 100
R908 220
R907 12k
C920 150p
C903 33p
EP CH2
SP CH1
EP CH1
SP CH2
CN801 8P
EP CH2 F
EP CH2 S
SP CH1 F
SP CH1 S
EP CH1 F
EP CH1 S
SP CH2 F
SP CH2 S
JL001
JL002
JL003
JL004
JL005
JL006
JL007
JL008
C836 18p
L813 10μH
C801 0.022 F
R801 82
L801 220μH
C814 0.1 F
R802 330
C815 0.1 F
R805 12
C802 0.022 F
R806 82
C803 0.022
R807 82
C838 0.01 F
C816 0.1
C883 100
C804 0.1
R811 330
L814 10μH
C839 18p
L802 220μH
C805 0.022
R812 82
4.2 (2.2)
4.8 (0)
0 (0.7)
4.7(0)
0 (0.7)
4.3 (2.2)
(2.2)4.3
(5)2.2
(0.7) 0
0(0.7)
4.3(2.2)
①
⑥
⑦
05
CN802 4P

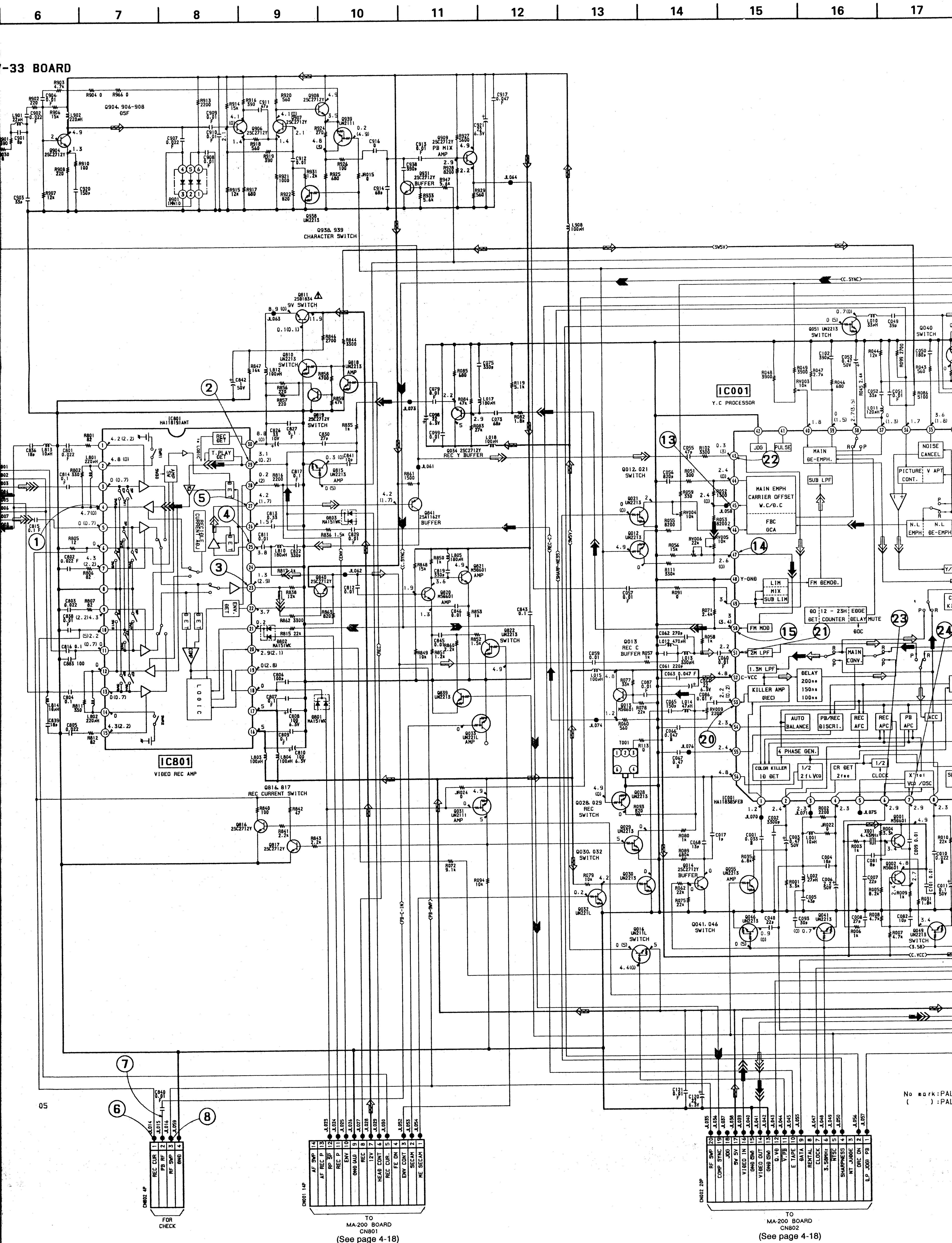

MA-200
(SERVO, SYSTEM CONTROL, NORMAL AUDIO)
RV-33
(HEAD AMP, VIDEO)
EU-1
(EURO CONNECTOR)
PD-47
(PDC)
MF-229
(POWER, EJECT SWITCHES)
HI-2
(LCD DRIVE)
MH-11
(TRANSLATION)

- Signal path

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC	➡	➡≫	➡≫≫
PB	⇨	⇨≫	⇨≫≫

- Signal path

	REC
Ref. signal	➤


6
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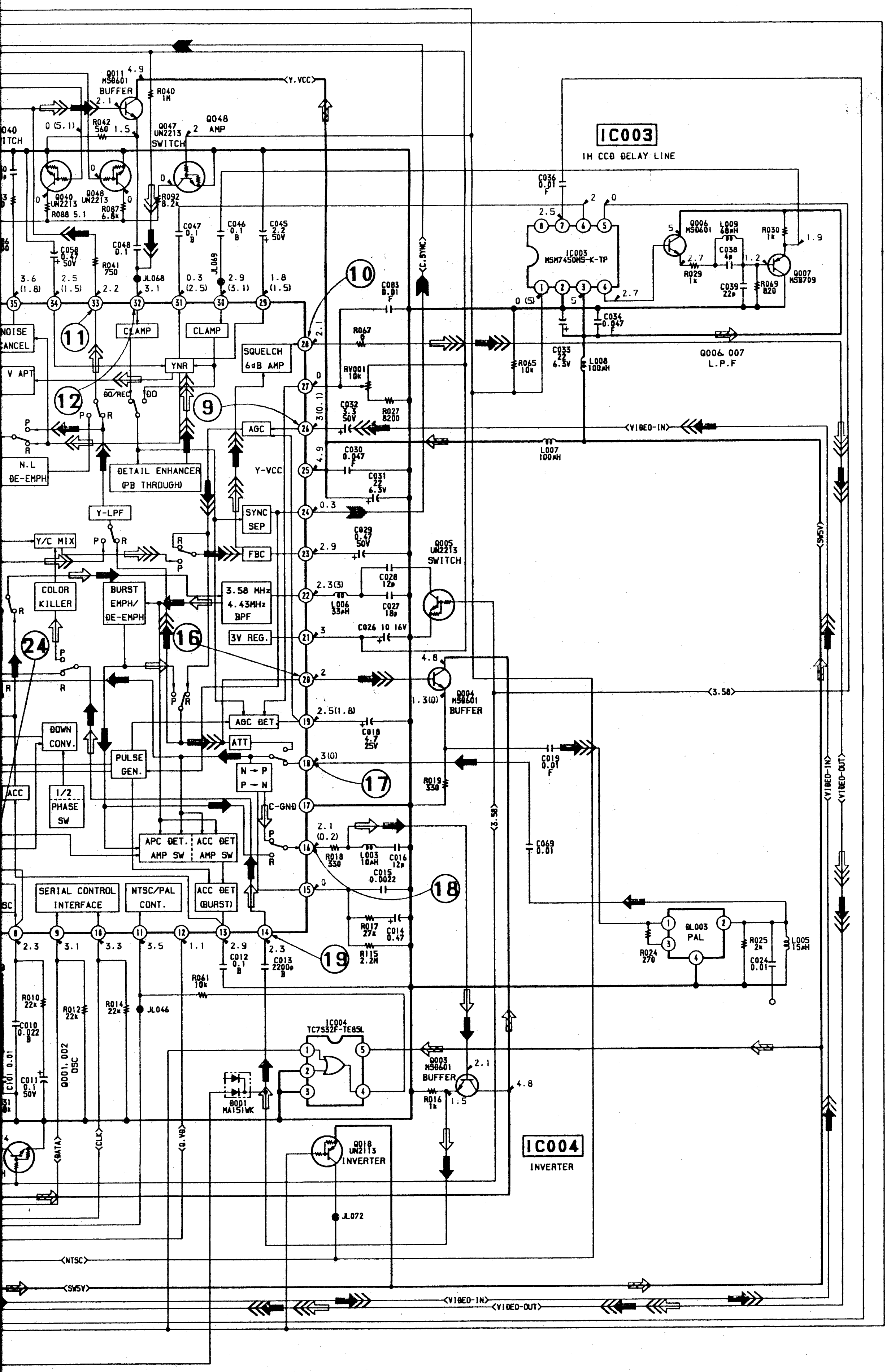
17
-33 BOARD
Q904, 906-908 OSF
Q938, 939 CHARACTER SWITCH
Q909 2SC2712Y PB MIX AMP
Q931 2SC2712Y BUFFER
Q811 2SB1834 9V SWITCH
Q810 UN2213 SWITCH
Q818 UN2213 AMP
Q819 2SC2712Y SWITCH
Q815 UN2213 AMP
Q034 2SC2712Y REC Y BUFFER
Q841 2SA1162Y BUFFER
IC801 HA11815IANT
IC801 VIDEO REC AMP
REC DET
T.PLAY DET
REC CURRENT ADJ.
ENV. DET
LOGIC
Q816, 817 REC CURRENT SWITCH
Q821 NS8601 AMP
Q820 NS8601 AMP
Q822 UN2213 SWITCH
Q839 UN2213
Q033 UN2211L AMP
Q031 UN2111 AMP
IC001 Y.C PROCESSOR
IC001 HA11835FEB
Q012, 021 SWITCH
Q013 REC C BUFFER
Q028, 029 REC SWITCH
Q030, 032 SWITCH
Q016 UN2211L SWITCH
Q014 2SC2712Y BUFFER
Q035 UN2213 AMP
Q041, 046 SWITCH
Q051 UN2213 SWITCH
Q040 SWITCH
Q049 UN2213 SWITCH
JOG
PULSE
MAIN DE-EMPH.
SUB LPF
NOISE CANCEL
PICTURE CONT.
V APT
N.L EMPH
N.L DE-EMPH
MAIN EMPH CARRIER OFFSET W.C/D.C
FBC GCA
LIM MIX SUB LIM
FM DEMOD.
FM MOD
Y-GND
C-VCC
2M LPF
1.3M LPF
KILLER AMP (REC)
DELAY 200ns 150ns 100ns
AUTO BALANCE
PB/REC DISCRI.
REC AFC
REC APC
PB APC
ACC
4 PHASE GEN.
COLOR KILLER ID DET
1/2 2fLVCO
CR DET 2fsc
1/2 CLOCK
X'tal VCO /OSC
ED DET
12 - 23H COUNTER
EDGE DELAY
MUTE
MAIN CONV.
<SW5V>
<C.SYNC>
<C.VCC>
<REC>
<ENV>
<SHARP-NESS>
<REC-C>
<PB-C-IN>
<PB-SWP>
CN802 4P
REC CUR
PB RF
RF SWP
GND
FOR CHECK
CN801 14P
AF SWP
AF REC P
RP SP
REC P
ENV
GND (AU)
REC
12V
HEAD CONT
REC CUR.
FE ON
ENV CONT
SECAM
ME SECAM
TO MA-200 BOARD CN801
(See page 4-18)
CN802 20P
RF SWP
COMP SYNC
JOG
5V SV
VIDEO IN
GND (SW)
VIDEO OUT
GND (SW)
Q. V0
V. PB
E TAPE
DATA
RENTAL
CLOCK
3.58MHz
NTSC
SHARPNESS
NT JUDGE
ORC ON
LP JOG PB
TO MA-200 BOARD CN802
(See page 4-18)
No mark:PAL
( ):PAL
05


18
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A
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D
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I
J
K
L
M
N
O
IC003
1H CCD DELAY LINE
IC003 MSM7450MS-K-TP
Q006 M58601
Q007 M58709
Q006, 007 L.P.F
Q011 M58601 BUFFER
Q047 UN2215 SWITCH
Q048 AMP
NOISE CANCEL
CLAMP
YNR
SQUELCH 6dB AMP
AGC
Y-VCC
DETAIL ENHANCER (PB THROUGH)
Y-LPF
SYNC SEP
FBC
Y/C MIX
COLOR KILLER
BURST EMPH/ DE-EMPH
3.58 MHz 4.43MHz BPF
3V REG.
AGC DET
ATT
DOWN CONV.
PULSE GEN.
N→P P→N
C-GND
1/2 PHASE SW
ACC
APC DET. AMP SW
ACC DET AMP SW
SERIAL CONTROL INTERFACE
NTSC/PAL CONT.
ACC DET (BURST)
Q005 UN2213 SWITCH
Q004 M58601 BUFFER
Q003 M58601 BUFFER
IC004 TC7S32F-TE85L
IC004 INVERTER
Q010 UN2113 INVERTER
D001 MA151WK
BL003 PAL
Q001, 002 OSC
(VIDEO-IN)
(VIDEO-OUT)
(SWSV)
(NTSC)
(3.58)
(Y.VCC)
(C.SYNC)
(DATA)
(CLK)
(D.VID)

rk:PAL REC (COMMON)
) :PAL PB

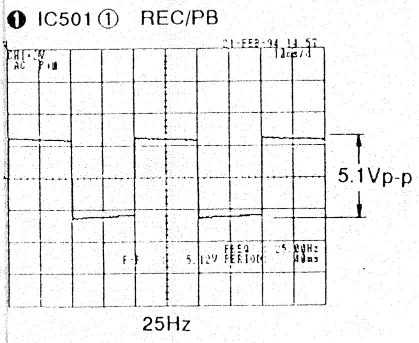
HEAD AMP, VIDEO

MA-200 (SERVO, SYSTEM CONTROL, NORMAL AUDIO), EU-1, (EURO CONNECTOR), PD-47 (PDC) MH-11 (TRANSLATION) PRINTED WIRING BOARDS

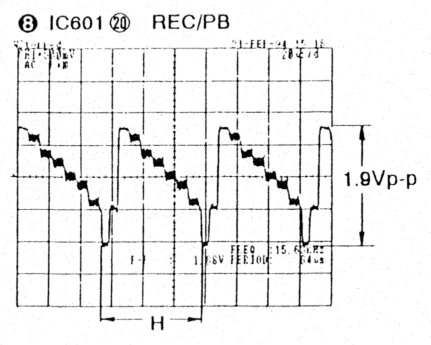
– Ref. No.: MA-200 Board; 2,000 series, MH-11 Board; 1,000 series, EU-1 and PD-47 Boars; 4,000 series –

MA-200 Board

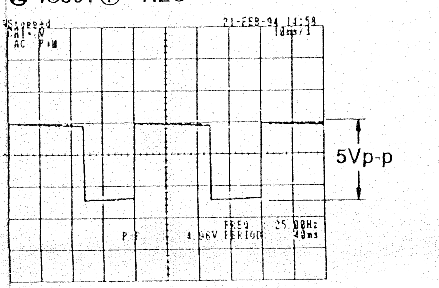
❶ IC501 ① REC/PB



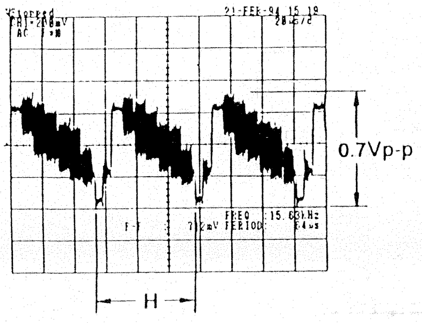
❽ IC601 ⑳ REC/PB



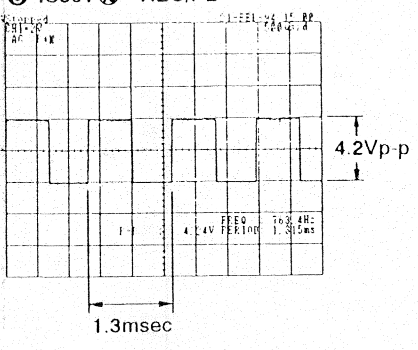
❷ IC501 ⑦ REC



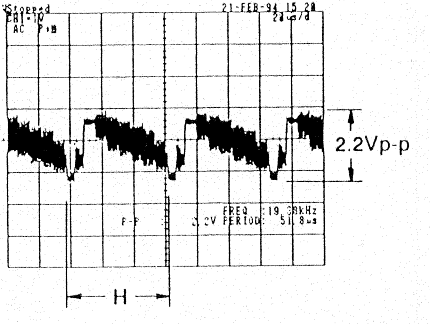
❾ IC801 ⑧ REC



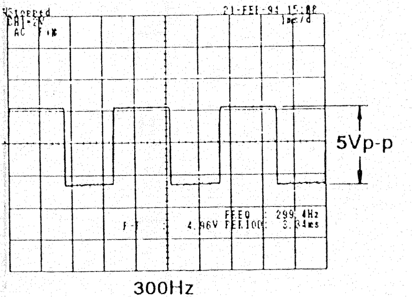
❸ IC501 ⑳ REC/PB



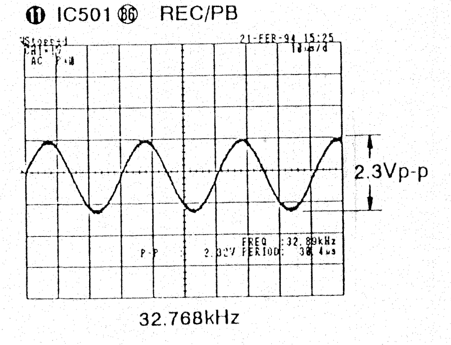
❿ IC601 ⑯, ⑱ REC/PB



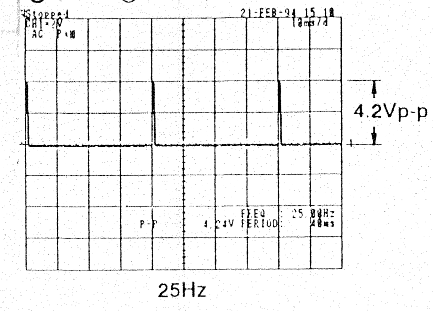
❹ IC501 ㊾ REC/PB



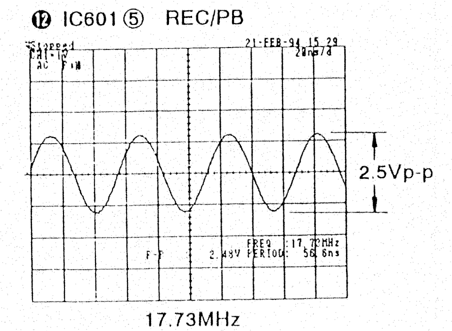
⓫ IC501 ㊶ REC/PB



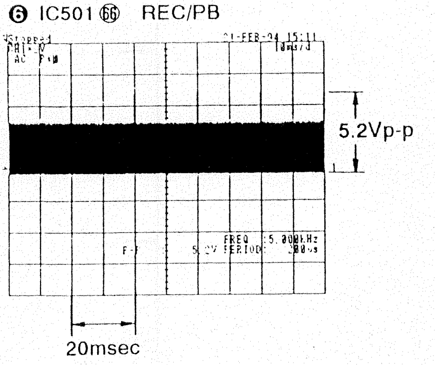
❺ IC501 ㊳ REC/PB



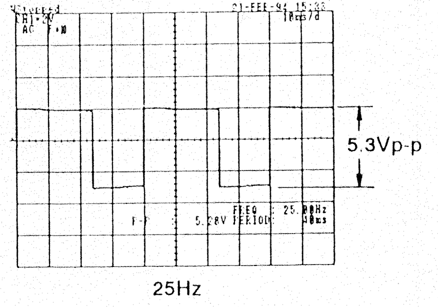
⓬ IC601 ⑤ REC/PB



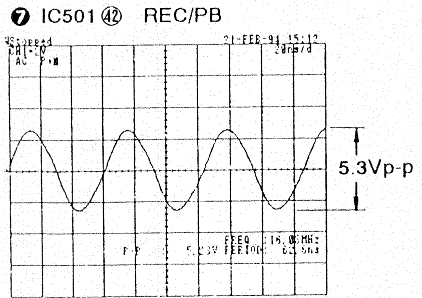
❻ IC501 ㊱ REC/PB

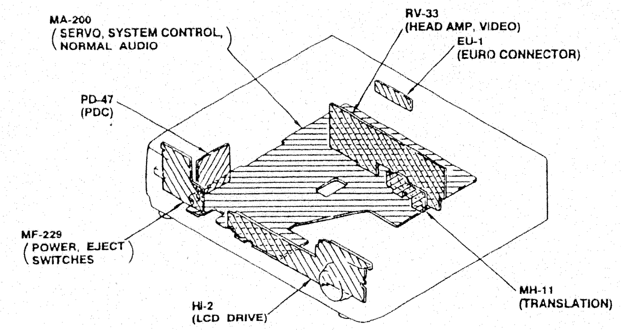


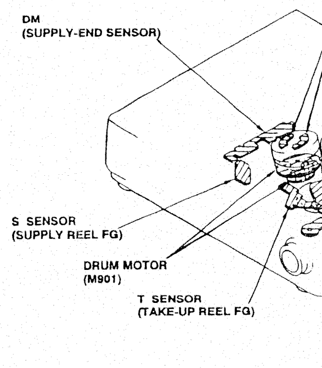
⓭ IC501 ㊲ PB



❼ IC501 ㊷ REC/PB

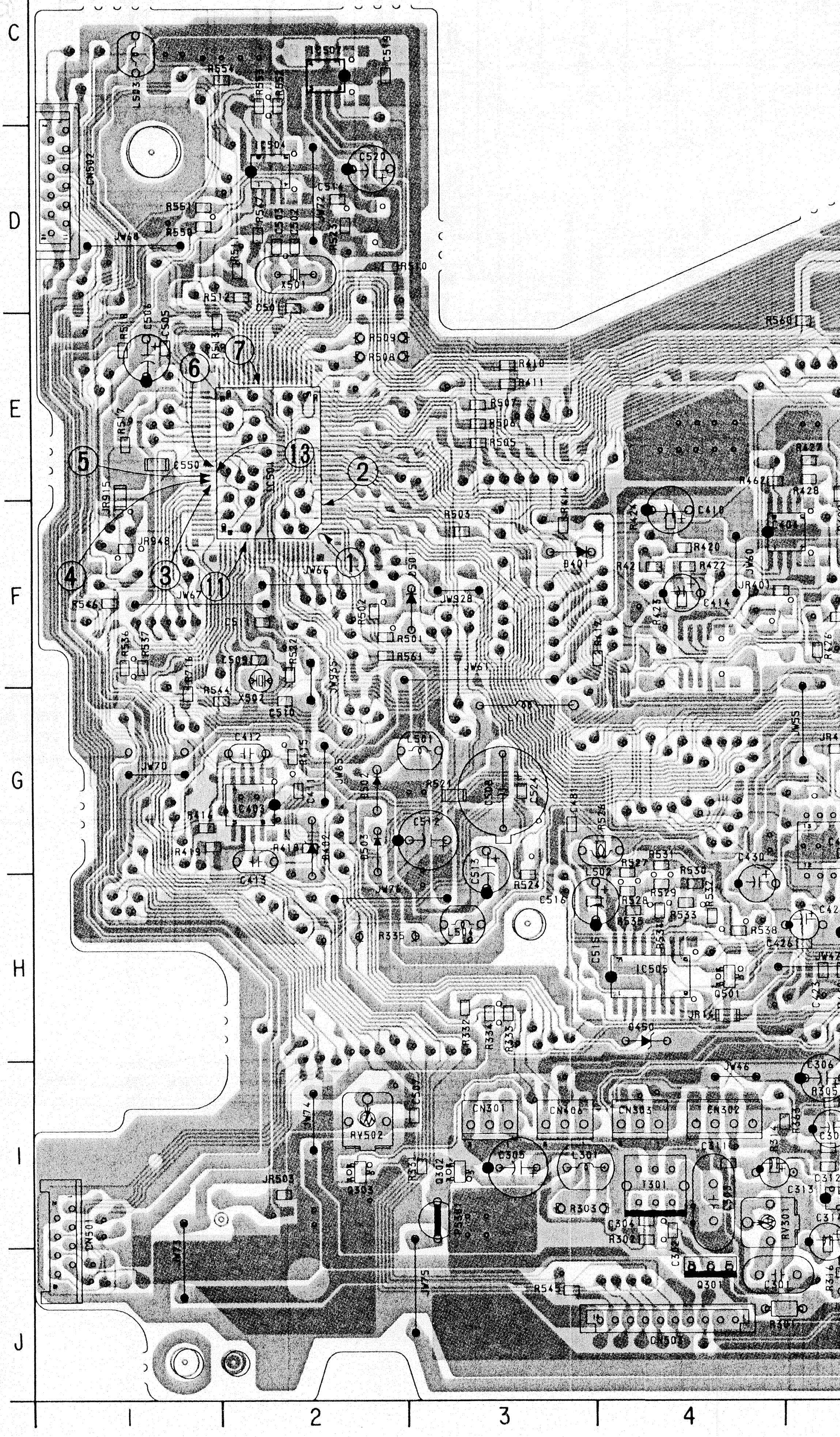



MA-200
(SERVO, SYSTEM CONTROL, NORMAL AUDIO)
RV-33
(HEAD AMP, VIDEO)
EU-1
(EURO CONNECTOR)
PD-47
(PDC)
MF-229
(POWER, EJECT SWITCHES)
HI-2
(LCD DRIVE)
MH-11
(TRANSLATION)


DM
(SUPPLY-END SENSOR)
S SENSOR
(SUPPLY REEL FG)
DRUM MOTOR
(M901)
T SENSOR
(TAKE-UP REEL FG)

- There is no indication for destination in the printed wiring board diagram.

MA-200 BOARD


A
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D
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1
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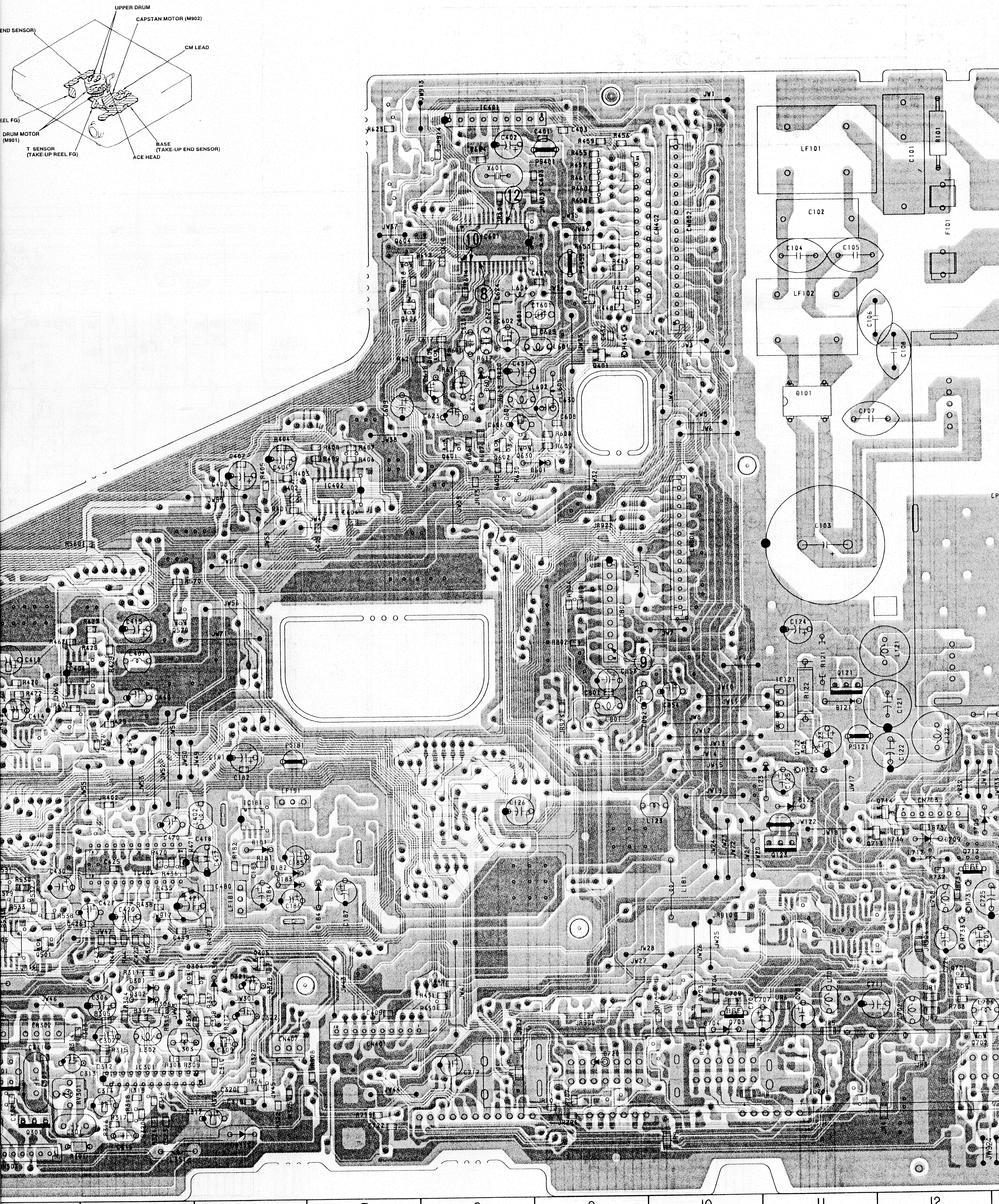
05
CN502
CN501
CN301
CN302
CN303
CN304
IC501
IC505
X501
X502
RY502
T301
Q301
Q302
Q303
Q501
D450
L501
L502
L503
R554
R561
R508
R509
R510
R503
R505
R506
R507
R410
R411
R420
R427
R428
R461
R530
R531
R532
R533
R535
R538
R541
R544
R546
C410
C412
C414
C430
C505
C506
C509
C510
C511
C514
C515
C516
C520
C550
JW46
JW47
JW48
JW61
JW65
JW66
JW67
JW74
JW75
JW76
JW78
JW92
JR503
JR915
JR948
①
②
③
④
⑤
⑥
⑦
⑪
⑬

DS


UPPER DRUM
CAPSTAN MOTOR (M902)
END SENSOR)
CM LEAD
EEL FG)
DRUM MOTOR (M901)
T SENSOR (TAKE-UP REEL FG)
ACE HEAD
BASE (TAKE-UP END SENSOR)
IC401
IC402
IC121
IC181
X601
LF101
LF102
LF181
LF191
C101
C102
C103
C104
C105
C106
C107
C108
R101
F101
D101
CN402
CN802
CN703
CN301
CN302
CN401
CN407
Q121
Q122
Q123
PS121
PS181
PS401
L121
L122
L123
CT601
JW1
JW2
JW3
8
9
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12
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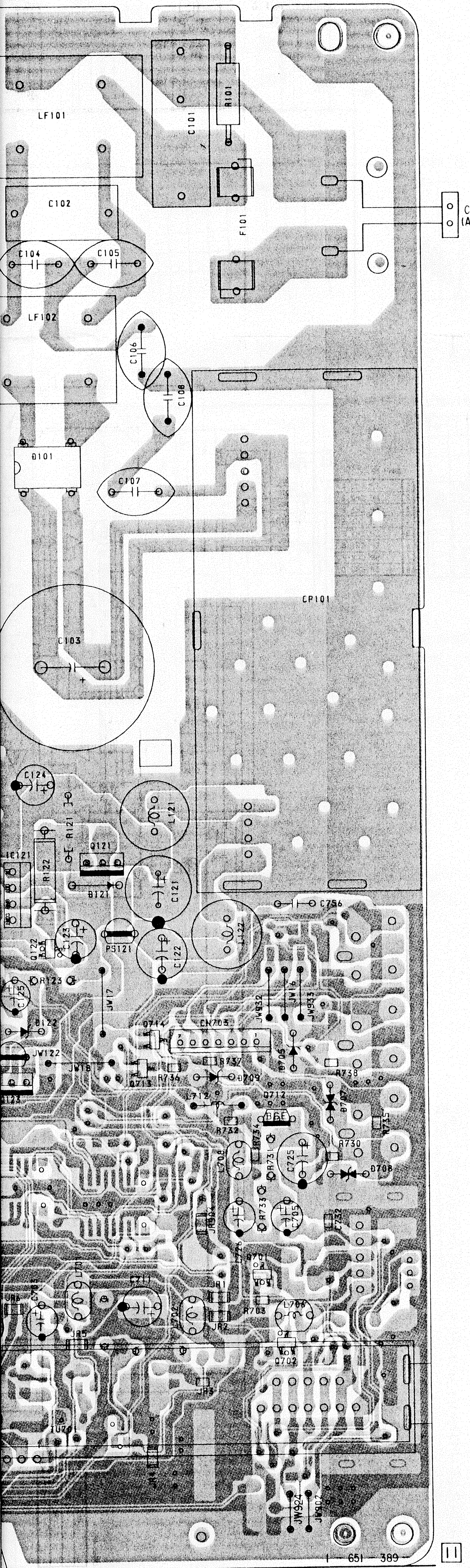
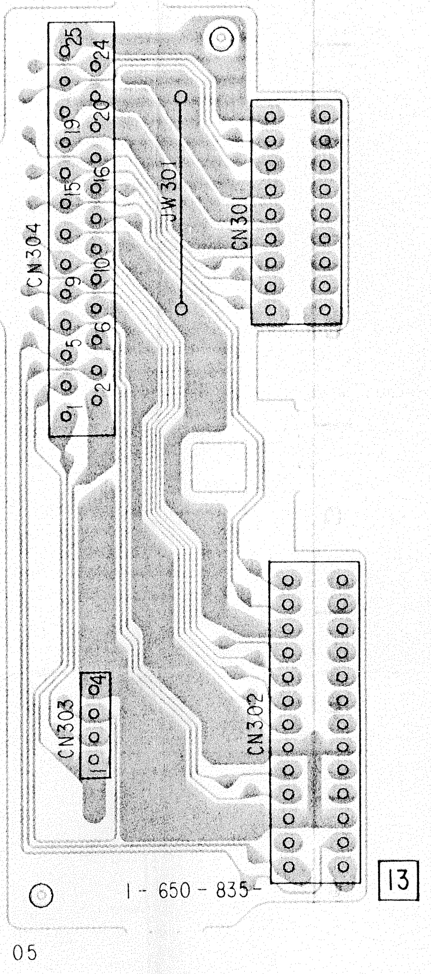
12


LF101
C101
R101
C102
F101
CN101
(AC IN)
C104
C105
LF102
C106
C108
D101
C107
CP101
C103
C124
L121
C121
IC121
R121
R122
Q121
B121
L122
C122
PS121
C756
CN703
1 - 651 - 389 -
11
11
12
13

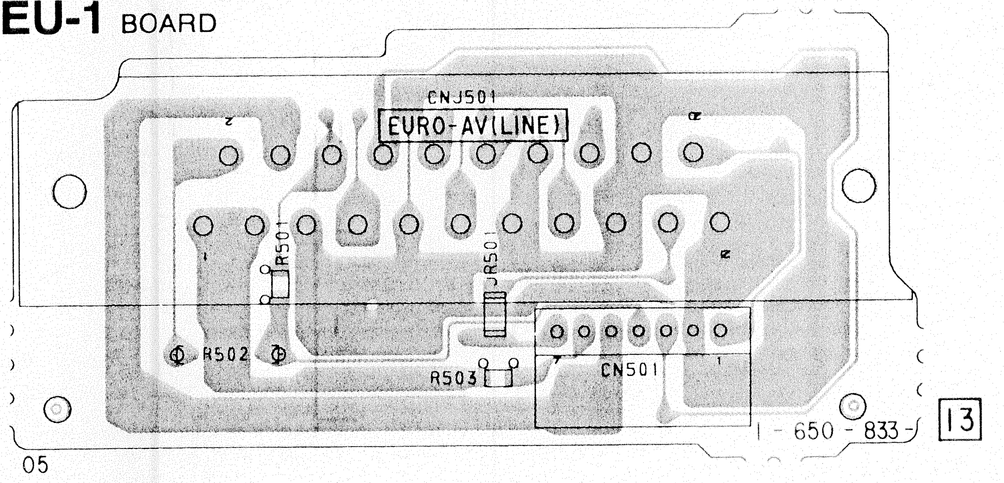
MH-11 BOARD


CN304
JW301
CN301
CN303
CN302
1 - 650 - 835 -
13
05

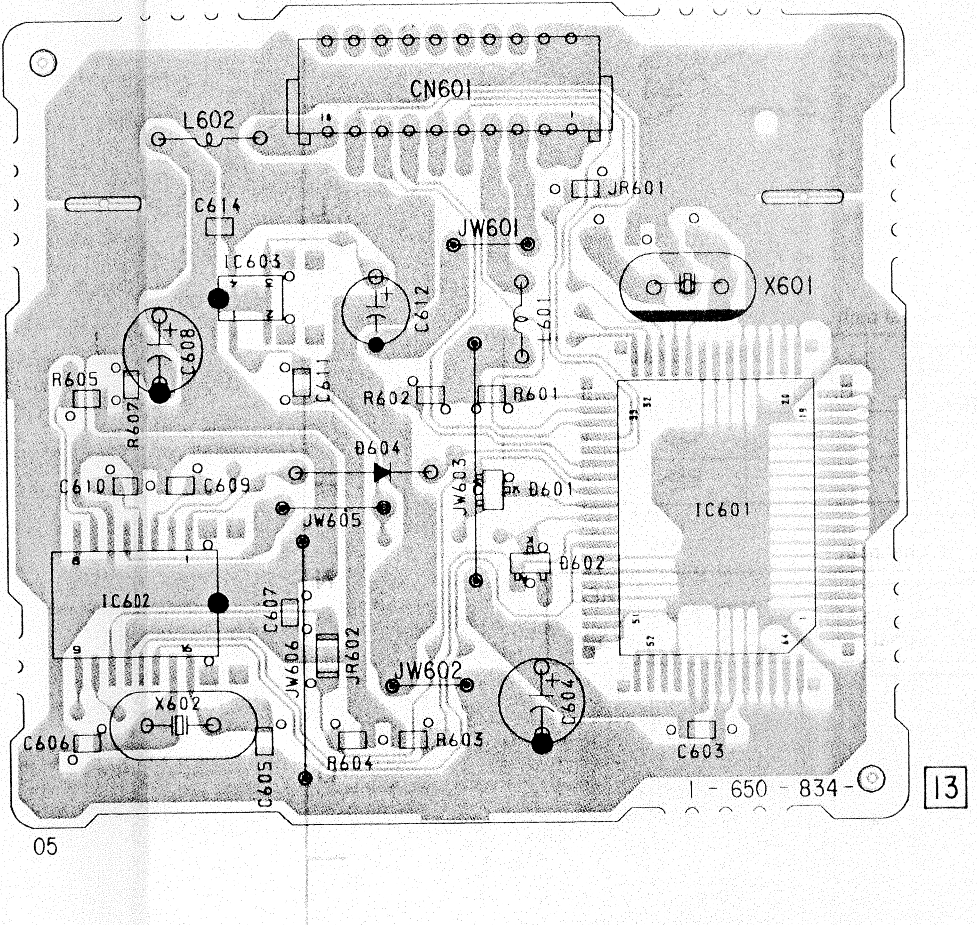
MA-200 BOARD

CN101	B-13
CN301	I-3
CN302	I-4
CN303	I-4
CN401	I-7
CN402	B-10
CN406	I-3
CN407	I-6
CN501	J-1
CN502	D-1
CN503	J-4
CN703	G-12
CN801	E-10
CN802	B-10
D101	C-11
D121	F-11
D122	G-11
D123	G-11
D181	G-6
D182	G-6
D183	G-6
D184	G-7
D301	H-5
D302	H-5
D304	H-6
D351	J-6
D401	F-3
D402	G-2
D450	H-4
D451	
D501	F-3
D502	G-3
D503	G-2
D550	
D551	
D601	D-8
D603	C-8
D703	I-10
D704	I-10
D705	G-12
D707	H-13
D708	H-13
D709	G-12
D720	I-9
IC121	F-11
IC181	G-6
IC301	I-5
IC401	A-8
IC402	D-7
IC403	G-2
IC404	F-5
IC406	G-5
IC501	E-2
IC504	D-2
IC505	H-4
IC507	C-2
IC601	B-8
IC801	E-9
Q121	F-11
Q122	G-11
Q123	F-11
Q301	J-4
Q302	I-3
Q303	I-2
Q304	H-5
Q305	H-6
Q401	C-9
Q501	H-4
Q570	E-5
Q601	D-8
Q602	D-8
Q604	B-8
Q605	C-8
Q606	C-8
Q630	D-8
Q701	H-12
Q703	I-10
Q712	H-12
Q714	G-12

EU-1 BOARD

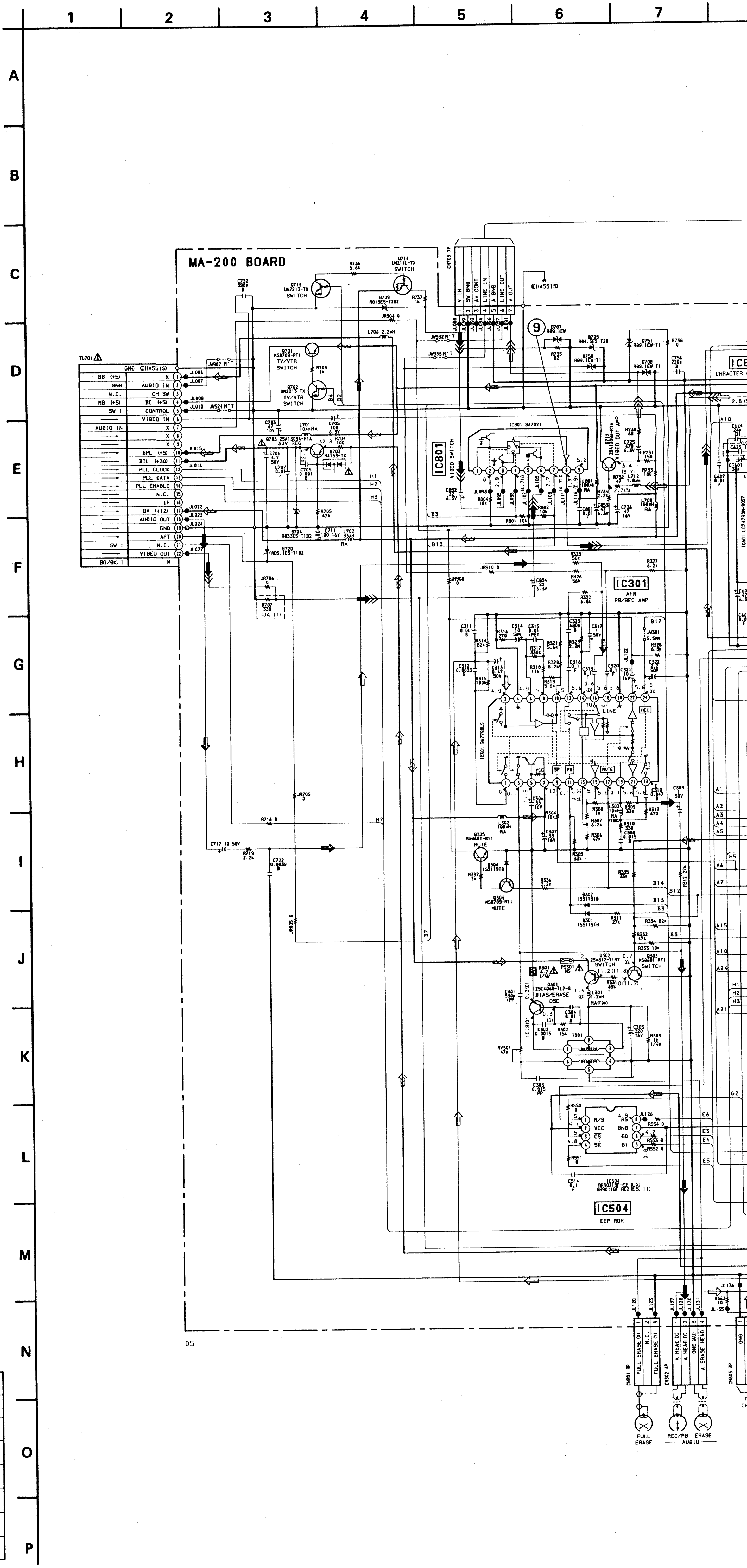

CNJ501
EURO-AV(LINE)
R501
JR501
R502
R503
CN501
1 - 650 - 833 -
13
05

PD-47 BOARD


CN601
L602
JR601
C614
JW601
IC603
X601
C612
C608
L601
R605
C611
R602
R601
R607
D604
C610
C609
JW603
D601
JW605
IC601
IC602
D602
C607
JW606
JR602
JW602
C604
X602
C606
R604
R603
C605
C603
1 - 650 - 834 -
13
05

MA-200 (SERVO, SYSTEM CONTROL, NORMAL AUDIO), EU-1, (EURO CONNECTOR), PD-47 (PDC) MH-11 (

– Ref. No.: MA-200 Board; 2,000 series, MH-11 Board; 1,000 series, EU-1 and PD-47 Boars; 4,000 series –



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M
N
O
P
MA-200 BOARD
TU701
IC801
VIDEO SWITCH
IC801 BA7021
IC301
AFM PB/REC AMP
IC301 BA7790LS
IC504
EEP ROM
CHASSIS
Q713 UN2213-TX SWITCH
Q714 UN211L-TX SWITCH
Q701 MSB709-RT1 TV/VTR SWITCH
Q702 UN2213-TX TV/VTR SWITCH
Q703 2SA1309A-RTA 5V REG
Q505 MSB601-RT1 MUTE
Q504 MSB709-RT1 MUTE
Q302 2SA812-T1M7 SWITCH
Q303 MSB601-RT1 SWITCH
Q301 2SC4060-TL2-Q BIAS/ERASE OSC
CN703 7P
CN301 3P
CN302 4P
CN303 3P
FULL ERASE
REC/PB ERASE
AUDIO
05

- Signal path

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	➡
PB	⇨	⇨»	⇨»»	⇨

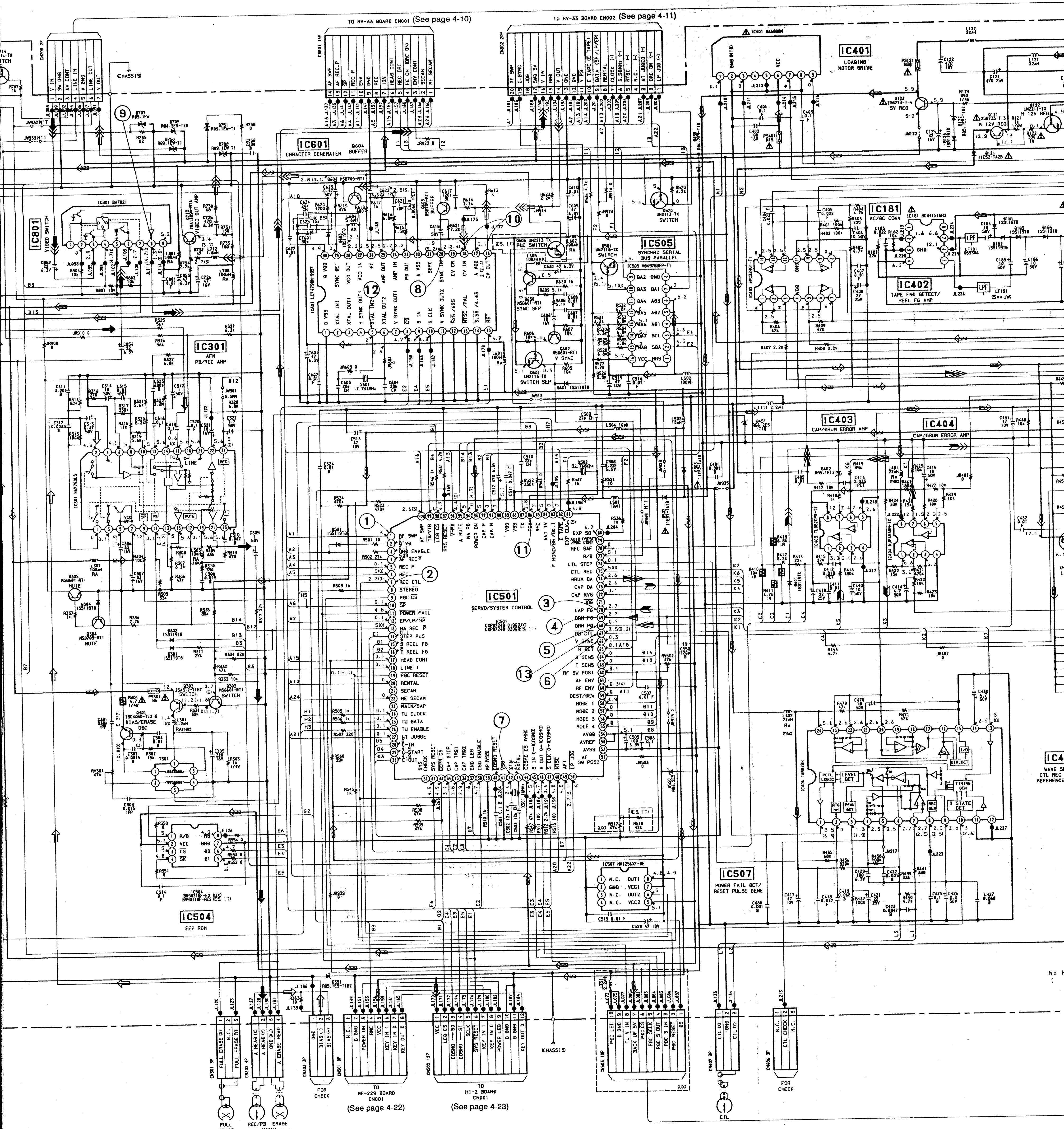
- Signal path

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷»	
Drum servo (speed and phase)		▷»»	
Capstan speed servo		⊐	
Capstan phase servo	➡»	⊐»	⊐»
Capstan servo (speed and phase)		⊐»»	
Ref. signal	➡		⊐

EU-1, (EURO CONNECTOR), PD-47 (PDC) MH-11 (TRANSLATION) SCHEMATIC DIAGRAM

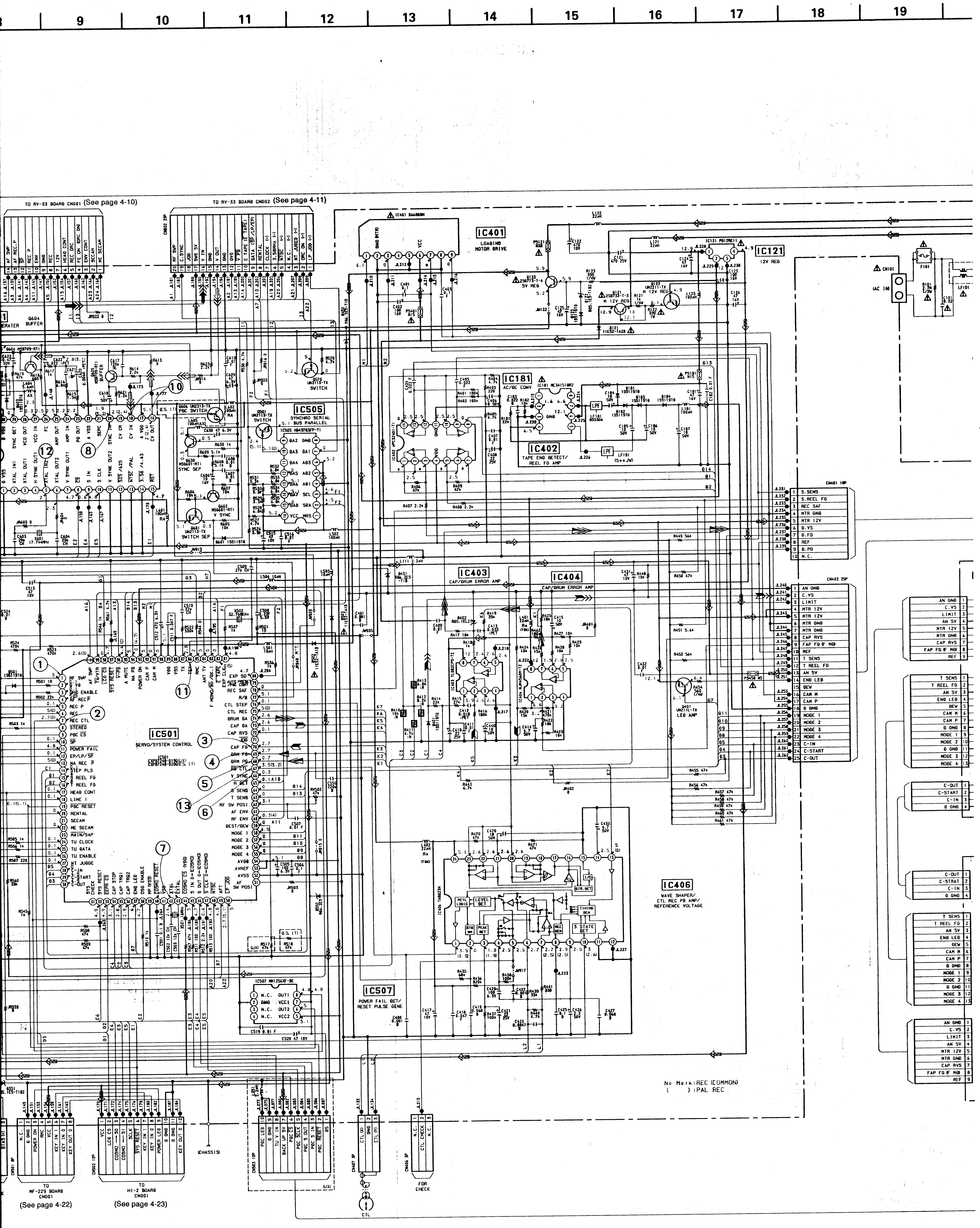
s, EU-1 and PD-47 Boars; 4,000 series –

5 6 7 8 9 10 11 12 13 14 15 16



TO RV-33 BOARD CN001 (See page 4-10)
TO RV-33 BOARD CN002 (See page 4-11)
IC801 VIDEO SWITCH
IC601 CHRACTER GENERATER
Q604 BUFFER
IC301 AFM PB/REC AMP
IC505 SYNCHRO SERIAL BUS PARALLEL
IC401 LOADING MOTOR DRIVE
IC181 AC/DC CONV
IC402 TAPE END DETECT/ REEL FG AMP
IC403 CAP/DRUM ERROR AMP
IC404 CAP/DRUM ERROR AMP
IC501 SERVO/SYSTEM CONTROL
IC504 EEP ROM
IC507 POWER FAIL DET/ RESET PULSE GENE
Q606 PDC SWITCH
Q601 SWITCH SEP
Q602 V SYNC
Q570 SWITCH
Q501 SWITCH
Q123 5V REG
Q121 M 12V REG
Q304 MUTE
Q305 MUTE
Q302 SWITCH
Q303 SWITCH
Q501 BIAS/ERASE OSC
CHASSIS
FULL ERASE
REC/PB AUDIO
ERASE
FOR CHECK
TO MF-229 BOARD CN001 (See page 4-22)
TO HI-2 BOARD CN001 (See page 4-23)
CTL

RANSLATION) SCHEMATIC DIAGRAM


9
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16
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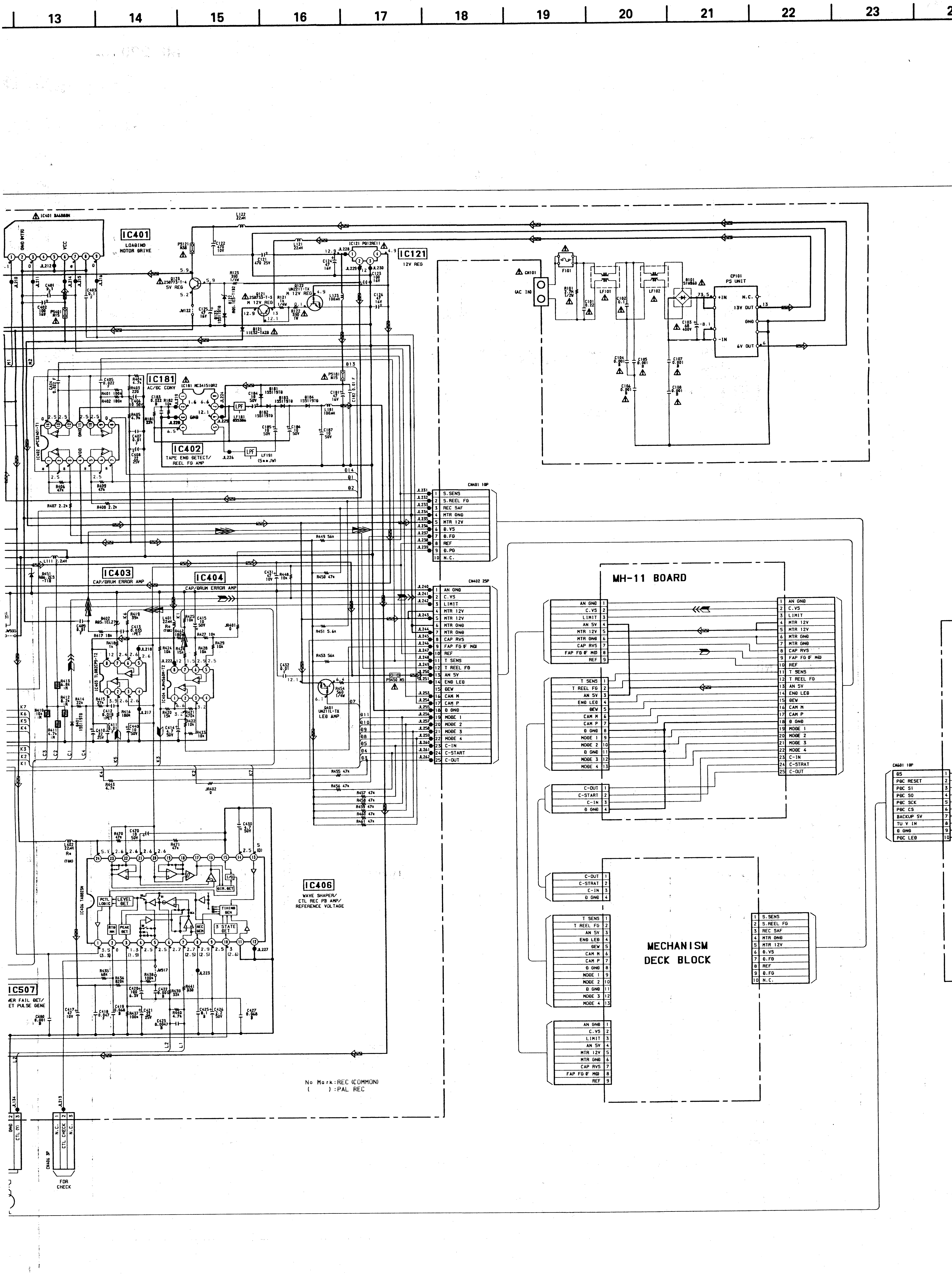
18
19
TO RV-33 BOARD CN001 (See page 4-10)
TO RV-33 BOARD CN002 (See page 4-11)
IC401 LOADING MOTOR DRIVE
IC121 12V REG
5V REG
M 12V REG
IC181 AC/DC CONV
IC402 TAPE END DETECT/ REEL FG AMP
IC505 SYNCHRO SERIAL BUS PARALLEL
SWITCH
SYNC SEP
V SYNC
BUFFER
IC501 SERVO/SYSTEM CONTROL
IC403 CAP/DRUM ERROR AMP
IC404 CAP/DRUM ERROR AMP
IC406 WAVE SHAPER/ CTL REC PB AMP/ REFERENCE VOLTAGE
IC507 POWER FAIL DET/ RESET PULSE GENE
LED AMP
CN401 10P
CN402 25P
AC IN
TO MF-229 BOARD CN001
(See page 4-22)
TO HI-2 BOARD CN001
(See page 4-23)
(CHASSIS)
FOR CHECK
CTL
No Mark:REC (COMMON)
( ) :PAL REC


13
14
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16
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19
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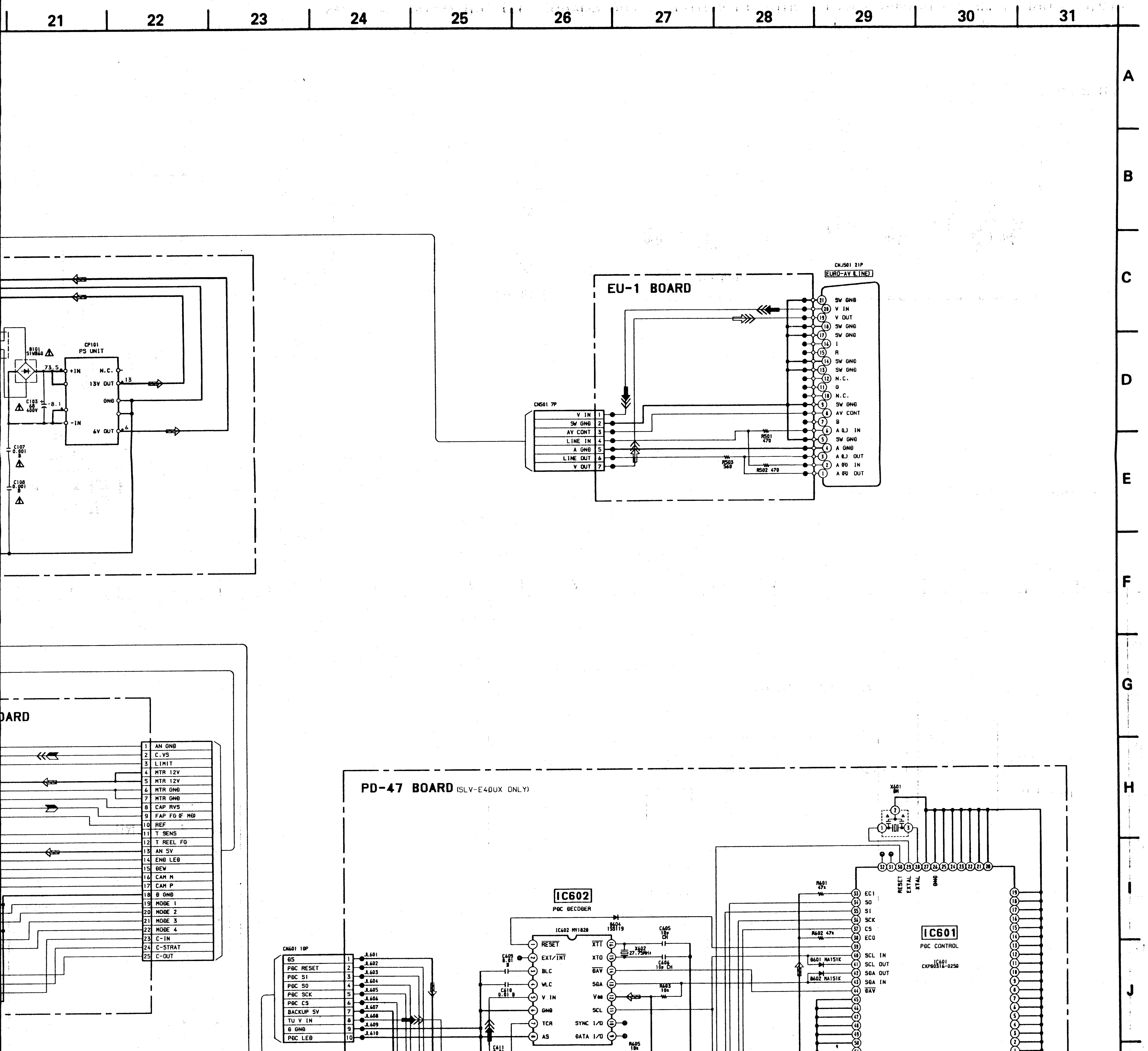
21
22
23
IC401
LOADING MOTOR DRIVE
IC121
12V REG
IC181
AC/DC CONV
IC402
TAPE END DETECT/ REEL FG AMP
IC403
CAP/DRUM ERROR AMP
IC404
CAP/DRUM ERROR AMP
IC406
WAVE SHAPER/ CTL REC PB AMP/ REFERENCE VOLTAGE
IC507
CP101
PS UNIT
AC IN
CN101
F101
LF101
LF102
N.C.
13V OUT
GND
6V OUT
+IN
-IN
CN401 10P
S.SENS
S.REEL FG
REC SAF
MTR GND
MTR 12V
D.VS
D.FG
REF
D.PG
N.C.
CN402 25P
AN GND
C.VS
LIMIT
MTR 12V
MTR GND
CAP RVS
FAP FG OF MOD
T SENS
T REEL FG
AN 5V
END LED
DEW
CAM M
CAM P
D GND
MODE 1
MODE 2
MODE 3
MODE 4
C-IN
C-START
C-OUT
MH-11 BOARD
MECHANISM DECK BLOCK
CN601 10P
D5
PBC RESET
PBC SI
PBC SO
PBC SCK
PBC CS
BACKUP 5V
TU V IN
D GND
PBC LED
Q401
LED AMP
PS450
FOR CHECK
CTL CHECK
No Mark:REC (COMMON)
( ):PAL REC


21
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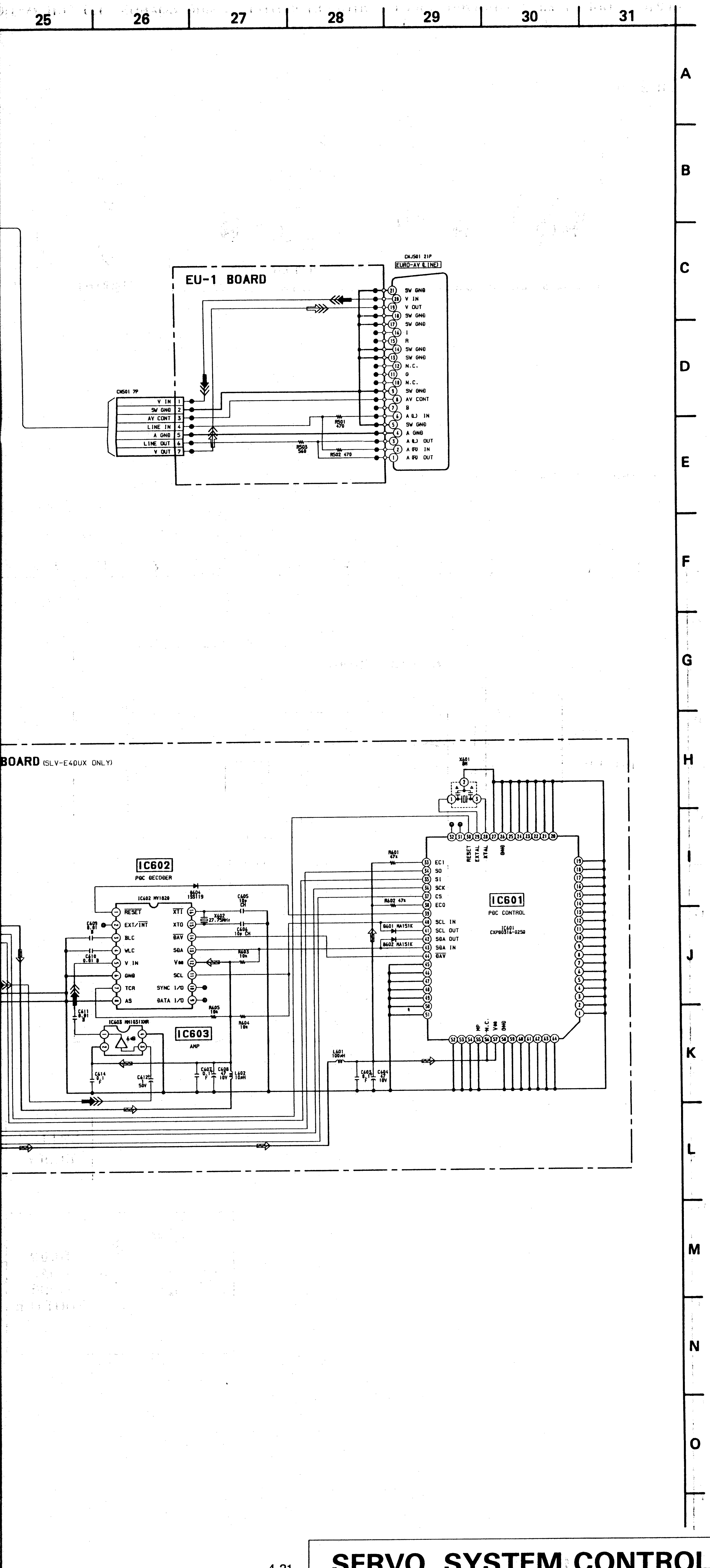
30
31
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
CP101
PS UNIT
+IN
-IN
N.C.
13V OUT
GND
6V OUT
D101
C103
C107
C108
EU-1 BOARD
CNJ501 21P
EURO-AV (LINE)
SW GND
V IN
V OUT
SW GND
SW GND
I
R
SW GND
SW GND
N.C.
G
N.C.
SW GND
AV CONT
B
A (L) IN
SW GND
A GND
A (L) OUT
A (R) IN
A (R) OUT
CN501 7P
V IN
SW GND
AV CONT
LINE IN
A GND
LINE OUT
V OUT
R501 470
R503 560
R502 470
BOARD
AN GND
C.VS
LIMIT
MTR 12V
MTR 12V
MTR GND
MTR GND
CAP RVS
FAP FG & MD
REF
T SENS
T REEL FG
AN 5V
END LED
DEW
CAM M
CAM P
D GND
MODE 1
MODE 2
MODE 3
MODE 4
C-IN
C-STRAT
C-OUT
CHANISM
K BLOCK
S.SENS
S.REEL FG
REC SAF
MTR GND
MTR 12V
D.VS
D.FG
REF
D.FG
N.C.
PD-47 BOARD (SLV-E40UX ONLY)
CN601 10P
DS
PDC RESET
PDC SI
PDC SO
PDC SCK
PDC CS
BACKUP 5V
TU V IN
D GND
PDC LED
IC602
PDC DECODER
IC602 MV1820
RESET
EXT/INT
BLC
WLC
V IN
GND
TCR
AS
XTI
XTO
DAV
SDA
VDD
SCL
SYNC I/O
DATA I/O
D604 1SS119
X602 27.75MHz
IC603 NM1031XNR
IC603
AMP
X601
R601 47k
R602 47k
D601 MA151K
D602 MA151K
L601 100μH
IC601
PDC CONTROL
IC601 CXP80516-025Q
ECI
SO
SI
SCK
CS
ECO
SCL IN
SCL OUT
SDA OUT
SDA IN
DAV
RESET
EXTAL
XTAL
GND
MP
N.C.
VDD
GND


25
26
27
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31
A
B
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H
I
J
K
L
M
N
O
EU-1 BOARD
CNJ501 21P
EURO-AV (LINE)
21 SW GND
20 V IN
19 V OUT
18 SW GND
17 SW GND
16 I
15 R
14 SW GND
13 SW GND
12 N.C.
11 G
10 N.C.
9 SW GND
8 AV CONT
7 B
6 A (L) IN
5 SW GND
4 A GND
3 A (L) OUT
2 A (R) IN
1 A (R) OUT
CN501 7P
V IN 1
SW GND 2
AV CONT 3
LINE IN 4
A GND 5
LINE OUT 6
V OUT 7
R501 470
R502 470
R503 560
BOARD (SLV-E40UX ONLY)
IC602
PDC DECODER
IC602 MV1820
D604 1SS119
C605 10p CH
C606 10p CH
X602 27.75MHz
RESET
EXT/INT
BLC
WLC
V IN
GND
TCR
AS
XTI
XTO
DAV
SDA
Vdd
SCL
SYNC I/O
DATA I/O
C609 0.01 B
C610 0.01 B
C611 0.01 B
R603 10k
R604 10k
R605 10k
IC603 MM1031XMR
IC603
AMP
6dB
C614 0.1 F
C612 1 50V
C607 0.1 F
C608 47 10V
L602 10μH
X601 8M
IC601
PDC CONTROL
IC601 CXP80316-0250
RESET
EXTAL
XTAL
GND
R601 47k
R602 47k
EC1
SO
SI
SCK
CS
ECO
SCL IN
SCL OUT
SDA OUT
SDA IN
DAV
D601 MA151K
D602 MA151K
MP
N.C.
Vdd
GND
L601 100μH
C603 0.1 F
C604 47 10V

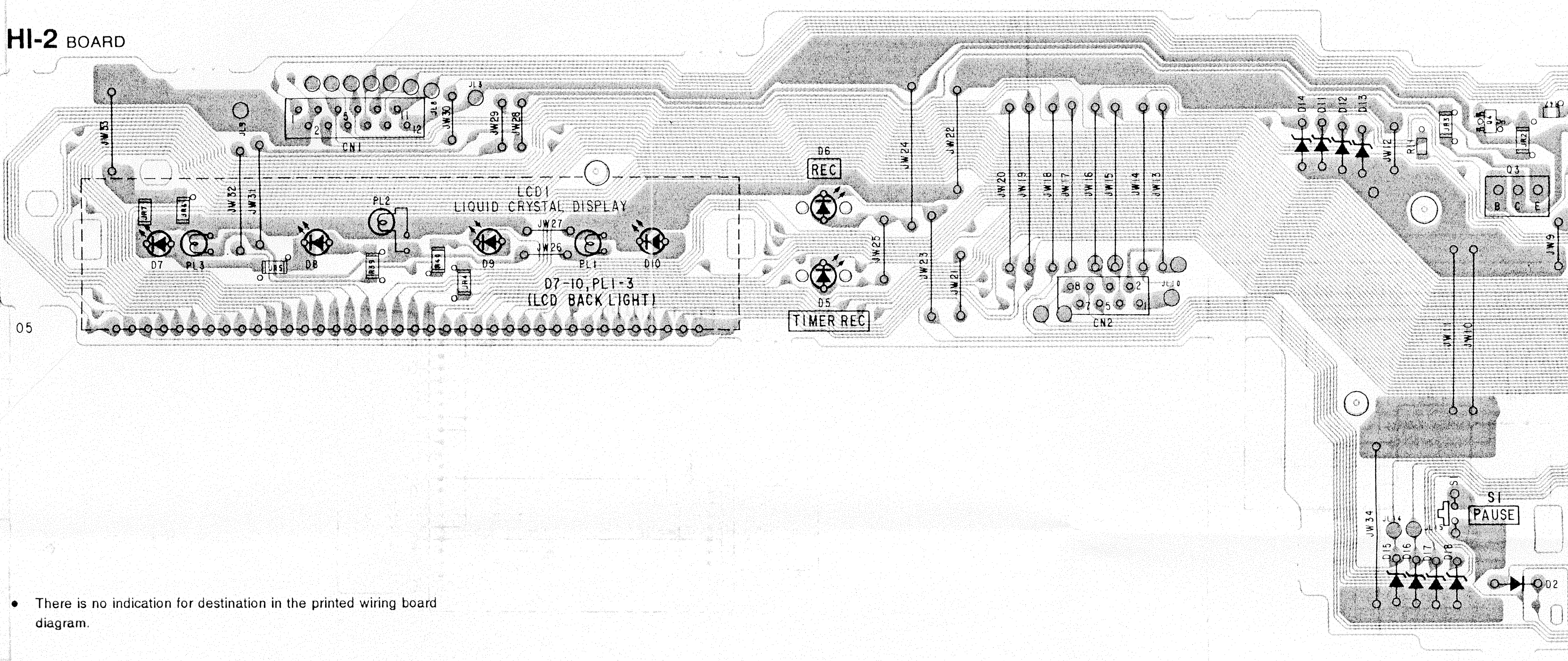
SERVO, SYSTEM CONTROL

SLV-E40ES/E40IT/E40UX

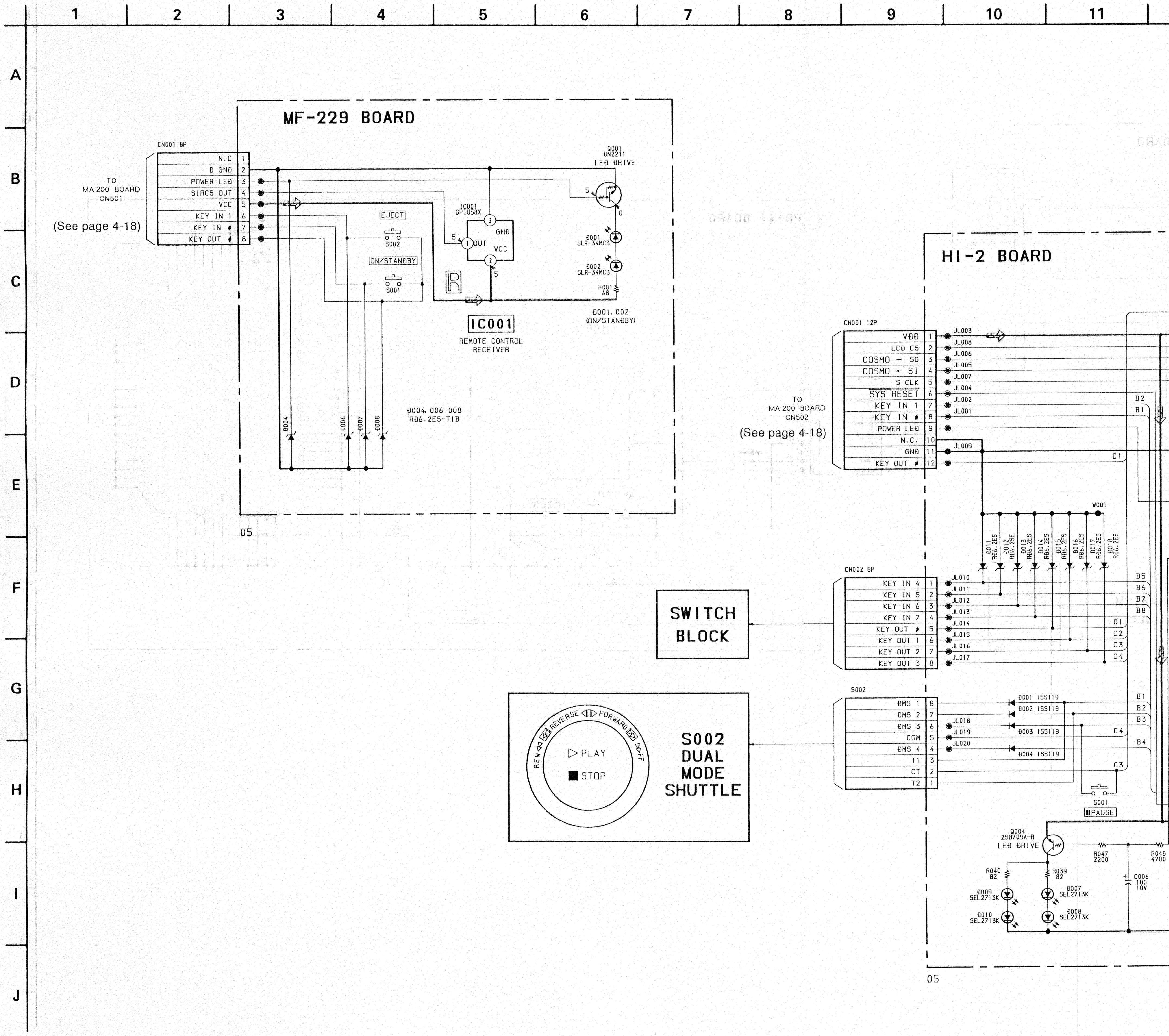
HI-2 (LCD DRIVE), MF-229 (POWER, EJECT SWITCHES) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

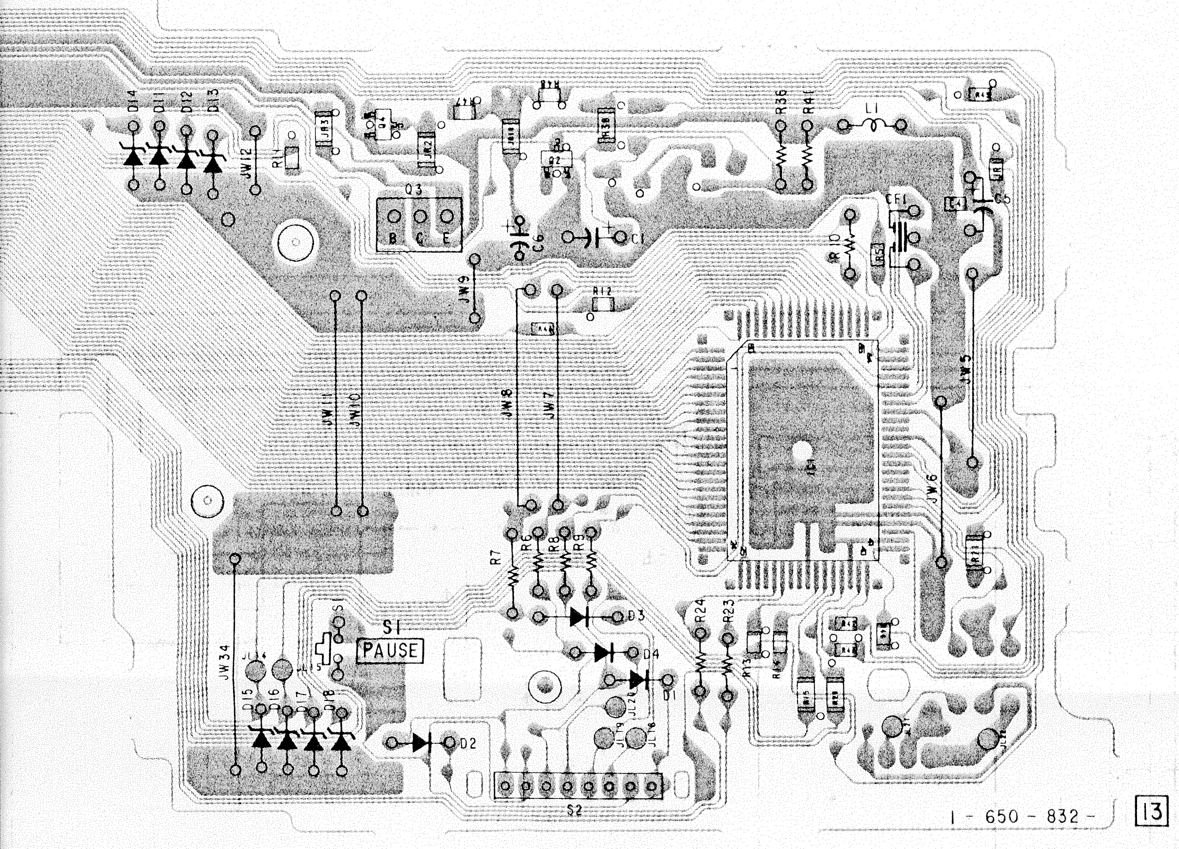
– Ref. No.: HI-2 and MF-229 Boards; 3,000 series –

HI-2 BOARD

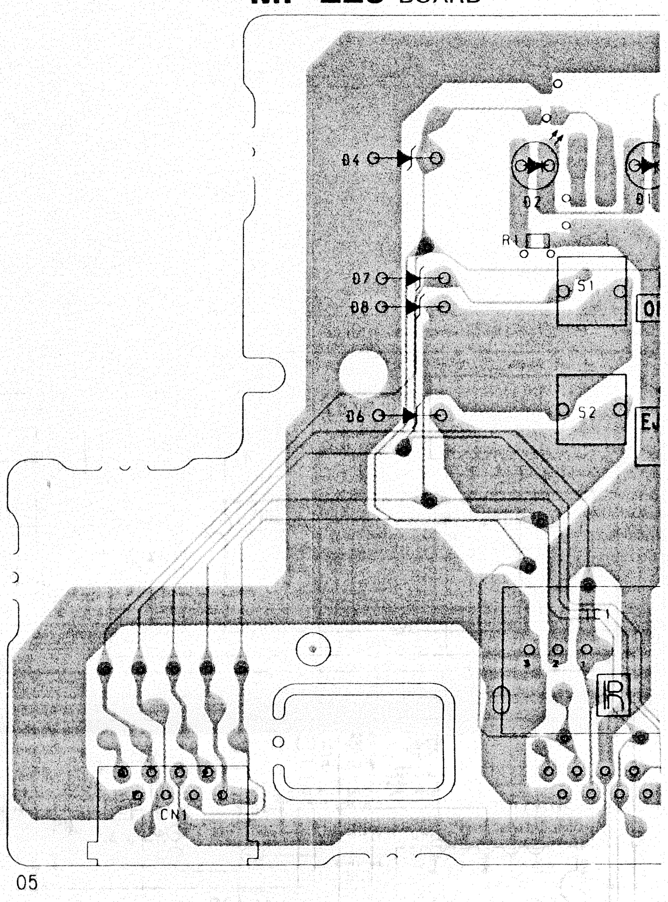

CN1
JW33
JW32
JW31
JW30
JW29
JW28
LCD1
LIQUID CRYSTAL DISPLAY
PL2
JW27
JW26
PL1
PL3
D7
D8
D9
D10
D7-10, PL1-3
(LCD BACK LIGHT)
D6
REC
D5
TIMER REC
JW24
JW22
JW25
JW23
JW21
JW20
JW19
JW18
JW17
JW16
JW15
JW14
JW13
CN2
D14
D11
D12
D13
JW12
Q3
JW11
JW10
JW9
S1
PAUSE
JW34
D15
D16
D17
D18
D2
05

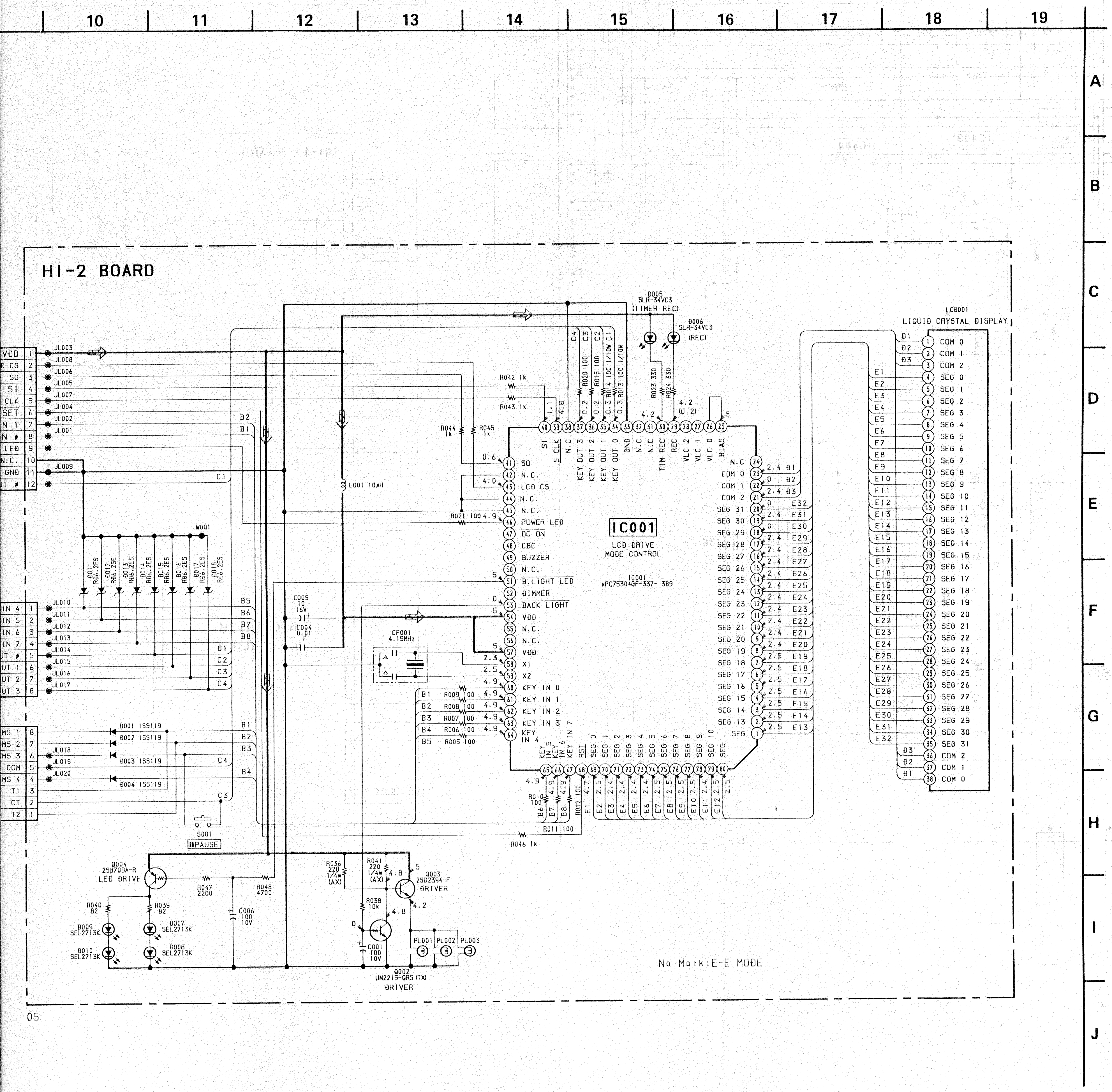
- There is no indication for destination in the printed wiring board diagram.

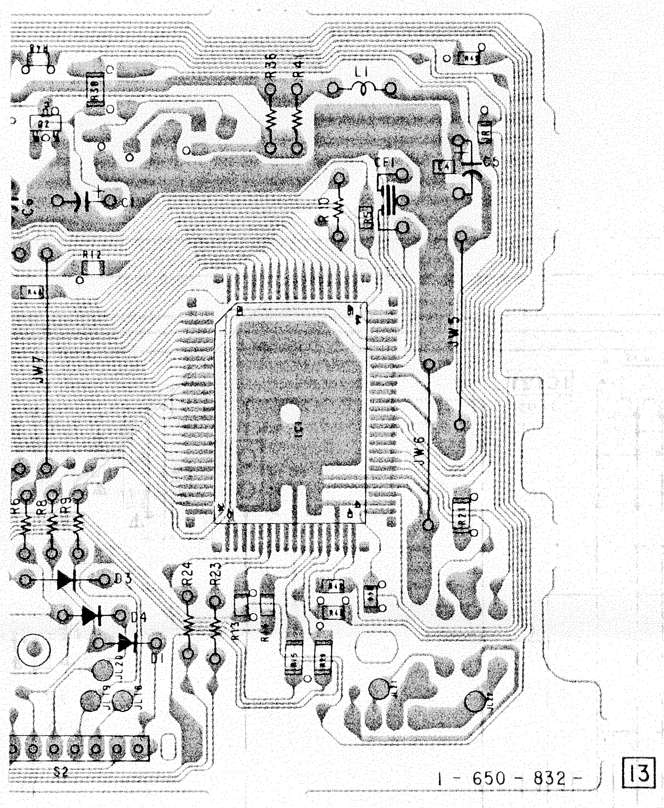

1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
H
I
J
MF-229 BOARD
CN001 8P
TO
MA-200 BOARD
CN501
(See page 4-18)
N.C 1
B GND 2
POWER LED 3
SIRCS OUT 4
VCC 5
KEY IN 1 6
KEY IN ∅ 7
KEY OUT ∅ 8
EJECT
S002
ON/STANDBY
S001
IC001
GP1U58X
GND
OUT
VCC
Q001
UN2211
LED DRIVE
D001
SLR-34MC3
D002
SLR-34MC3
R001
68
D001, 002
(ON/STANDBY)
IC001
REMOTE CONTROL
RECEIVER
D004
D006
D007
D008
D004, 006-008
RD6.2ES-T1B
05
HI-2 BOARD
CN001 12P
TO
MA-200 BOARD
CN502
(See page 4-18)
VDD 1
LCD CS 2
COSMO - SO 3
COSMO - SI 4
S CLK 5
SYS RESET 6
KEY IN 1 7
KEY IN ∅ 8
POWER LED 9
N.C. 10
GND 11
KEY OUT ∅ 12
JL003
JL008
JL006
JL005
JL007
JL004
JL002
JL001
JL009
W001
D011 RD6.2ES
D012 RD6.2ES
D013 RD6.2ES
D014 RD6.2ES
D015 RD6.2ES
D016 RD6.2ES
D017 RD6.2ES
D018 RD6.2ES
SWITCH
BLOCK
CN002 8P
KEY IN 4 1
KEY IN 5 2
KEY IN 6 3
KEY IN 7 4
KEY OUT ∅ 5
KEY OUT 1 6
KEY OUT 2 7
KEY OUT 3 8
JL010
JL011
JL012
JL013
JL014
JL015
JL016
JL017
B1
B2
B3
B4
B5
B6
B7
B8
C1
C2
C3
C4
S002
DMS 1 8
DMS 2 7
DMS 3 6
COM 5
DMS 4 4
T1 3
CT 2
T2 1
JL018
JL019
JL020
D001 1SS119
D002 1SS119
D003 1SS119
D004 1SS119
REVERSE
FORWARD
REW
FF
PLAY
STOP
S002
DUAL
MODE
SHUTTLE
S001
PAUSE
Q004
2SB709A-R
LED DRIVE
R047
2200
R048
4700
R040
82
R039
82
C006
100
10V
D009
SEL2713K
D010
SEL2713K
D007
SEL2713K
D008
SEL2713K
05


S1
PAUSE
S2
JW34
JW7
JW8
JW10
JW11
JW9
JW12
JW5
JW6
Q3
CF1
L1
I - 650 - 832 - 13

MF-229 BOARD

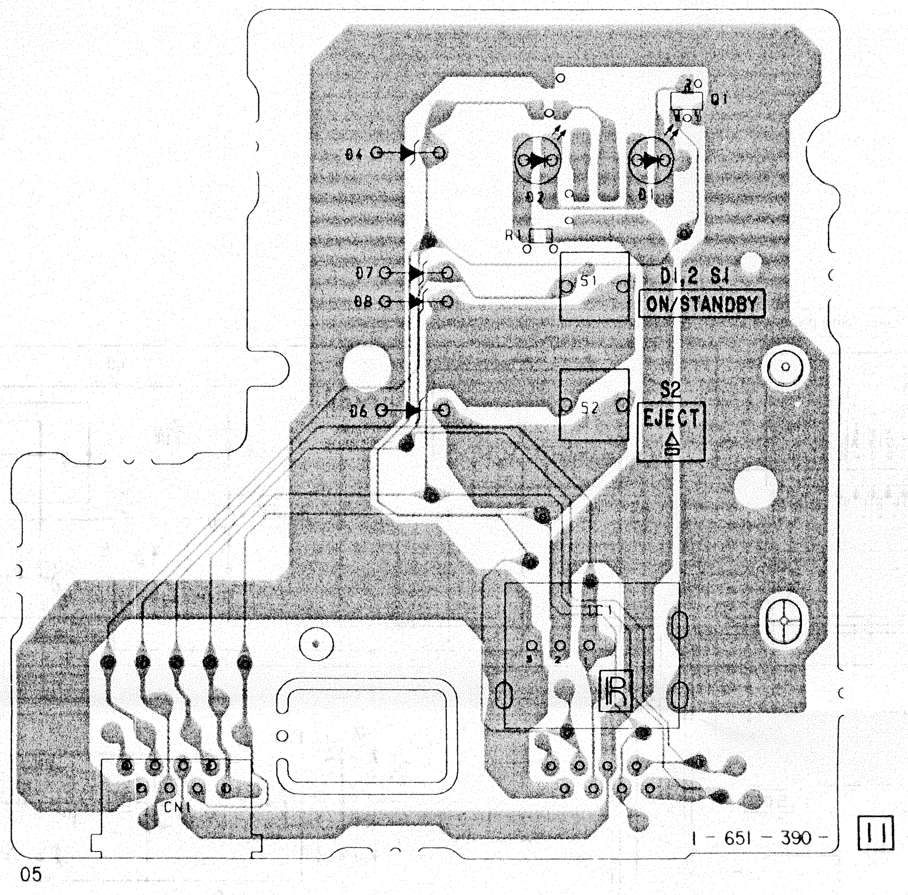

D4
D2
D7
D8
D6
S1
S2
R1
CN1
05


10
11
12
13
14
15
16
17
18
19
A
B
C
D
E
F
G
H
I
J
HI-2 BOARD
IC001
LCD DRIVE
MODE CONTROL
IC001
μPC75304GF-337-3B9
LCD001
LIQUID CRYSTAL DISPLAY
D005
SLR-34VC3
(TIMER REC)
D006
SLR-34VC3
(REC)
CF001
4.19MHz
L001 10μH
S001
PAUSE
Q004
2SB709A-R
LED DRIVE
Q003
2SD2394-F
DRIVER
Q002
UN2215-QRS (TX)
DRIVER
D009
SEL2713K
D010
SEL2713K
D007
SEL2713K
D008
SEL2713K
D001 1SS119
D002 1SS119
D003 1SS119
D004 1SS119
PL001
PL002
PL003
No Mark : E-E MODE
05

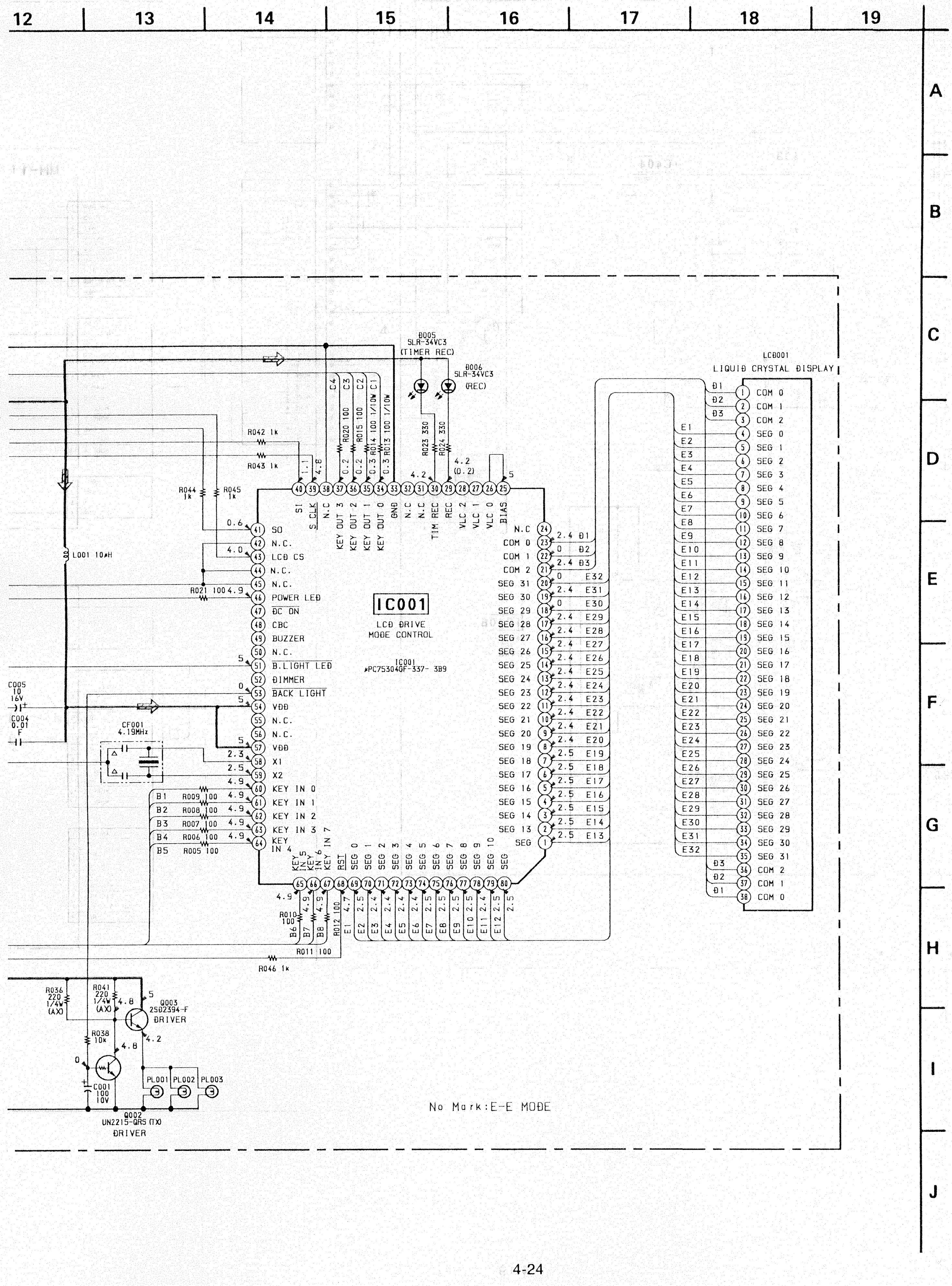


L1
R36
R41
IC1
JW7
JW6
JW5
D3
D4
R24
R23
S2
1 - 650 - 832 -
13

MF-229 BOARD



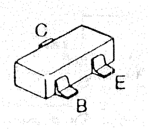
Q1
D4
D7
D8
D6
D1
D2
R1
S1
S2
D1,2 S1
ON/STANDBY
S2
EJECT
CN1
05
1 - 651 - 390 -
11



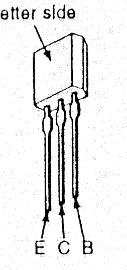
12
13
14
15
16
17
18
19
A
B
C
D
E
F
G
H
I
J
D005
SLR-34VC3
(TIMER REC)
D006
SLR-34VC3
(REC)
LCD001
LIQUID CRYSTAL DISPLAY
IC001
LCD DRIVE
MODE CONTROL
IC001
μPC75304GF-337-3B9
R042 1k
R043 1k
R044 1k
R045 1k
R020 100
R015 100
R014 100 1/10W
R013 100 1/10W
R023 330
R024 330
R021 100
L001 10μH
C005 10 16V
C004 0.01 F
CF001 4.19MHz
R009 100
R008 100
R007 100
R006 100
R005 100
R010 100
R012 100
R011 100
R046 1k
R036 220 1/4W (AX)
R041 220 1/4W (AX)
R038 10k
Q003 2SD2394-F DRIVER
Q002 UN2215-QRS (TX) DRIVER
C001 100 10V
PL001
PL002
PL003
SO
N.C.
LCD CS
N.C.
N.C.
POWER LED
DC ON
CBC
BUZZER
N.C.
B.LIGHT LED
DIMMER
BACK LIGHT
VDD
N.C.
N.C.
VDD
X1
X2
KEY IN 0
KEY IN 1
KEY IN 2
KEY IN 3
KEY IN 4
KEY IN 5
KEY IN 6
KEY IN 7
RST
S1
S CLK
KEY OUT 3
KEY OUT 2
KEY OUT 1
KEY OUT 0
GND
TIM REC
VLC 2
VLC 1
VLC 0
BIAS
COM 0
COM 1
COM 2
SEG 0 – SEG 31
E1 – E32
B1 B2 B3 B4 B5 B6 B7 B8
D1 D2 D3
No Mark:E-E MODE

4-3. SEMICONDUCTORS

MSD601-RT1
MSB709-RT1
UN2111
UN211L
UN2113
UN221L-TX
UN2211
UN2213
UN2215-QRS (TX)
2SA1162-G
2SA1162Y-TE85L
2SB709A-R
2SC2712-YG

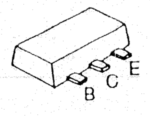


2SA1175-HFE

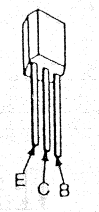


letter side
E C B

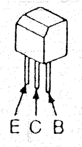
2SD1834



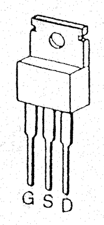
2SC4040-TL2-Q



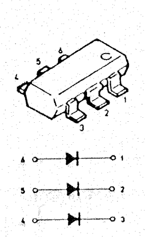
2SB733-34
2SD773-34



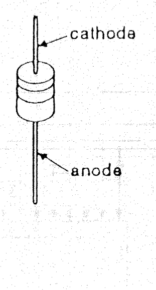
2SD2394-F



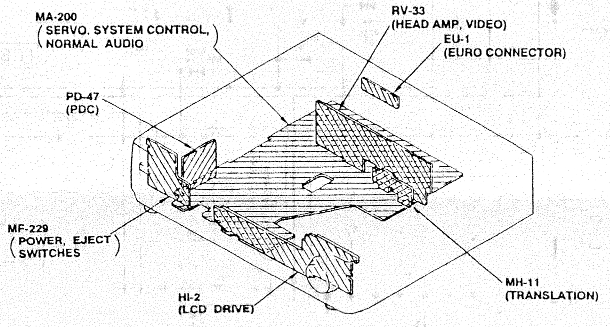
IMN10



RD13ES-B2
RD33ES-B2
RD4.3ES-B1
RD5.1ES-B2
RD6.2ES-B2
1SS119
11ES2

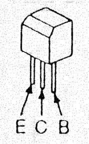


cathoda
anode

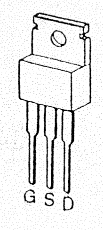

MA-200
(SERVO. SYSTEM CONTROL,
NORMAL AUDIO)
RV-33
(HEAD AMP, VIDEO)
EU-1
(EURO CONNECTOR)
PD-47
(PDC)
MF-229
(POWER, EJECT
SWITCHES)
HI-2
(LCD DRIVE)
MH-11
(TRANSLATION)

CONDUCTORS

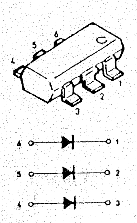
2SB733-34
2SD773-34



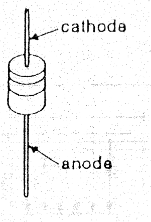
2SD2394-F



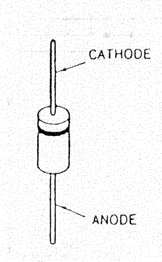
IMN10


4
5
6
1
2
3
4
1
5
2
4
3

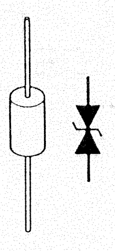
RD13ES-B2
RD33ES-B2
RD4.3ES-B1
RD5.1ES-B2
RD6.2ES-B2
1SS119
11ES2


cathode
anode

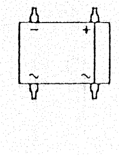
RD5.1E-L2


CATHODE
ANODE

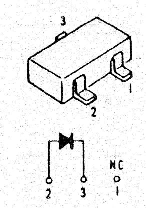
RD9.1E-W



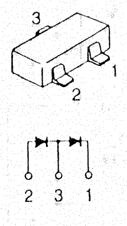
S1WB60



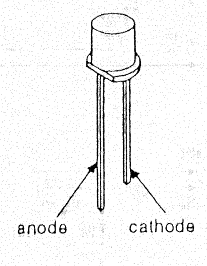
1SS184
1SS193



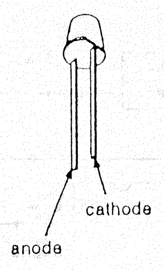
1SS226



SEL3713K-TP5


anode
cathode

SLR-34MC3
SLR-34VC3


cathode
anode

SECTION 5
REPAIR PARTS LIST

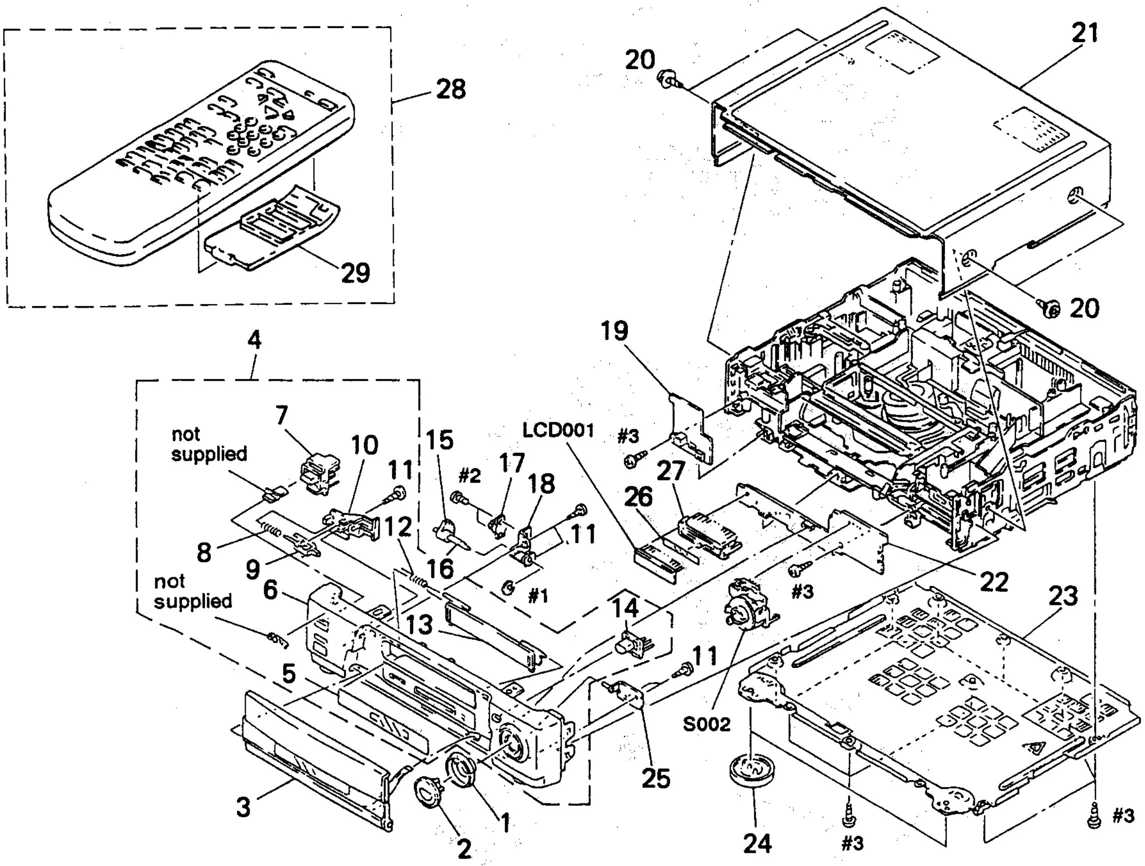
5-1. EXPLODED VIEWS

NOTE:

- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Items marked "＊" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1-1. FRONT PANEL ASSEMBLY

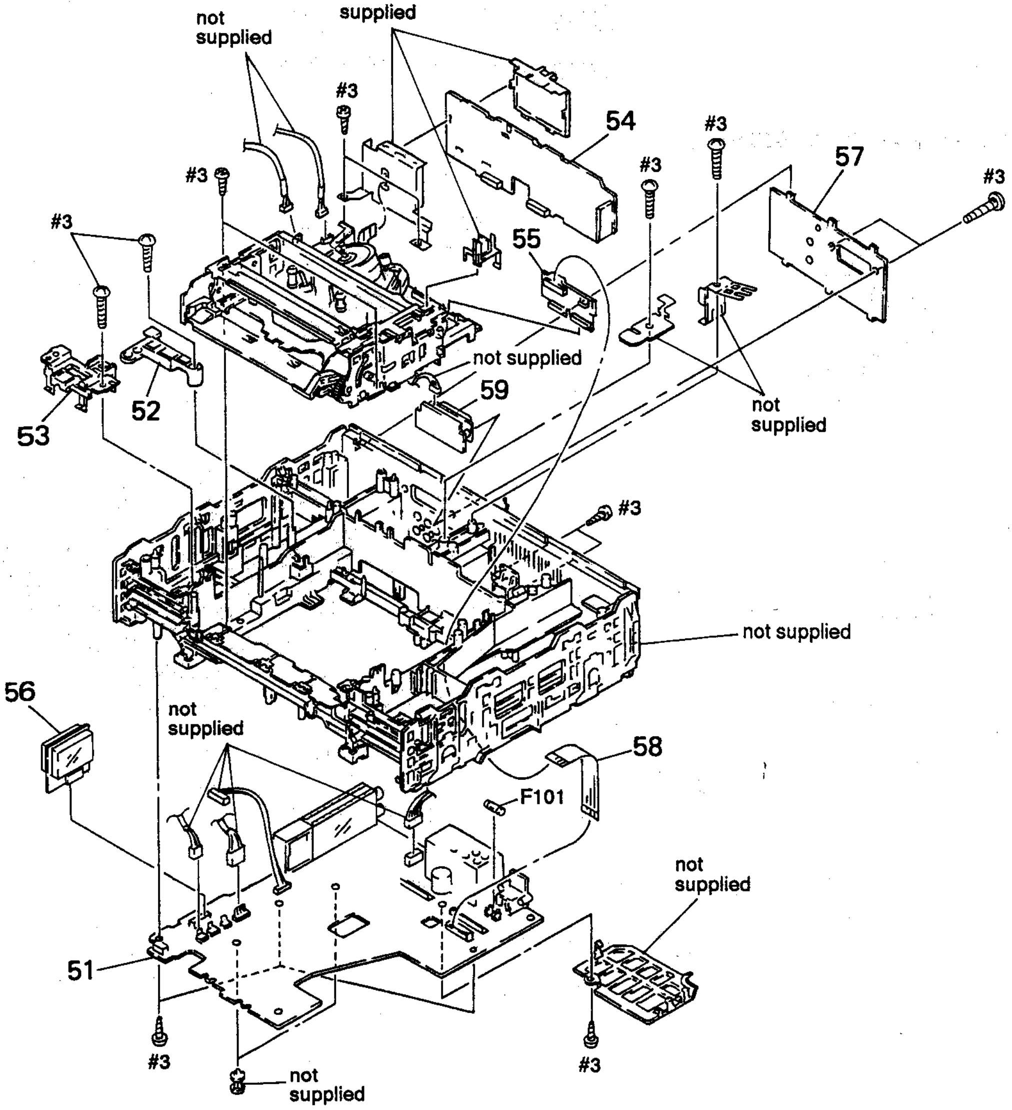


Ref. No.	Part No.	Description	Remark
1	X-3943-556-1	RING ASSY, SHUTTLE	
2	X-3943-557-2	BUTTON ASSY, FUNCTION	
3	1-467-489-41	SWITCH BLOCK, CONTROL (E40UX)	
3	1-467-489-61	SWITCH BLOCK, CONTROL (E40ES/E40IT)	
4	X-3943-864-1	PANEL ASSY, FRONT	
7	3-957-389-01	BUTTON, POWER/EJECT	
8	3-957-388-01	SPRING, COMPRESSION	
9	3-944-564-01	CLAW, LOCK	
10	3-957-212-01	HOLDER, LOCK CLAW	
11	4-921-277-11	SCREW (B2.6X8), TAPPING, BIND	
12	3-946-614-01	SPRING, FL	
13	3-954-735-31	DOOR, CASSETTE	
14	3-957-210-01	BUTTON, PAUSE	
15	3-957-382-01	GEAR, FULCRUM	
* 16	3-957-383-01	SHAFT, FULCRUM GEAR	
17	3-319-224-11	DAMPER, SMALL	

Ref. No.	Part No.	Description	Remark
* 18	3-957-381-01	PLATE, FULCRUM (LEFT), DOOR	
* 19	A-6721-635-A	MF-229 BOARD, COMPLETE	
20	3-710-901-11	SCREW, TAPPING	
* 21	3-957-396-01	CASE, UPPER	
* 22	A-6727-550-A	HI-2 BOARD, COMPLETE	
* 23	3-957-386-01	PLATE, BOTTOM	
24	3-957-246-01	INSULATOR	
* 25	X-3943-587-1	PLATE (RIGHT) ASSY, FULCRUM	
* 26	3-957-230-01	ILLUMINATOR	
* 27	3-957-206-01	HOLDER, LCD	
28	1-467-531-11	REMOTE COMMANDER (RMT-V148J) (E40UX)	
28	1-467-531-21	REMOTE COMMANDER (RMT-V148K) (E40ES/E40IT)	
29	3-943-535-01	COVER, BATTERY	
LCD001	1-810-409-21	DISPLAY PANEL, LIQUID CRYSTAL	
S002	1-692-840-21	SWITCH, ROTARY (PLAY/STOP/FF/REW)	

5-1-2. CHASSIS

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

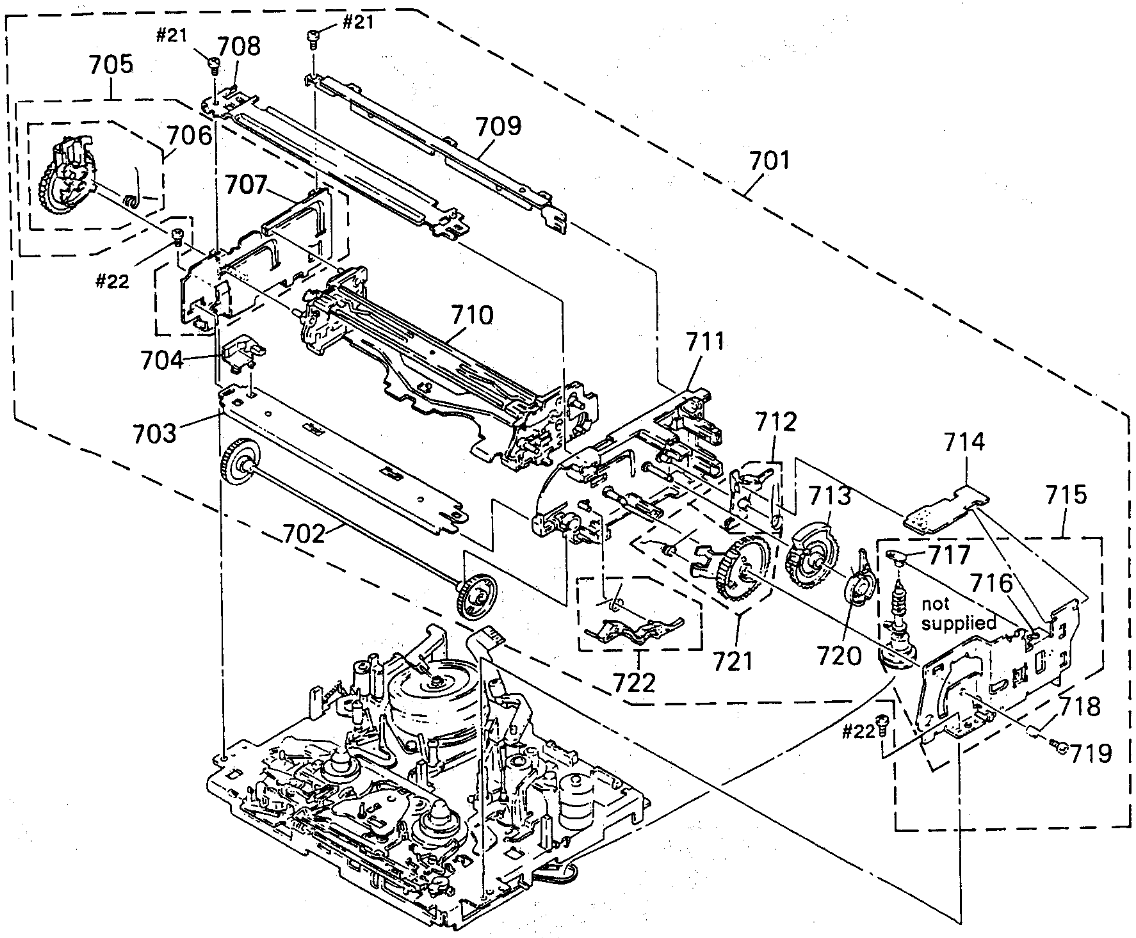


not supplied
not supplied
#3
54
#3
#3
57
#3
#3
#3
55
not supplied
59
52
53
not supplied
#3
not supplied
56
not supplied
58
F101
not supplied
51
#3
#3
not supplied

Ref. No.	Part No.	Description	Remark
* 51	A-6782-312-A	MA-200 BOARD, COMPLETE (E40UX)	
* 51	A-6782-313-A	MA-200 BOARD, COMPLETE (E40ES)	
* 51	A-6782-341-A	MA-200 BOARD, COMPLETE (E40IT)	
* 52	3-957-215-01	HOLDER (TU), FRAME	
* 53	3-957-214-01	HOLDER (HF), FRAME (E40UX)	
* 54	A-6721-636-A	RV-33 BOARD, COMPLETE	
* 55	A-6727-516-A	MH-11 BOARD, COMPLETE	

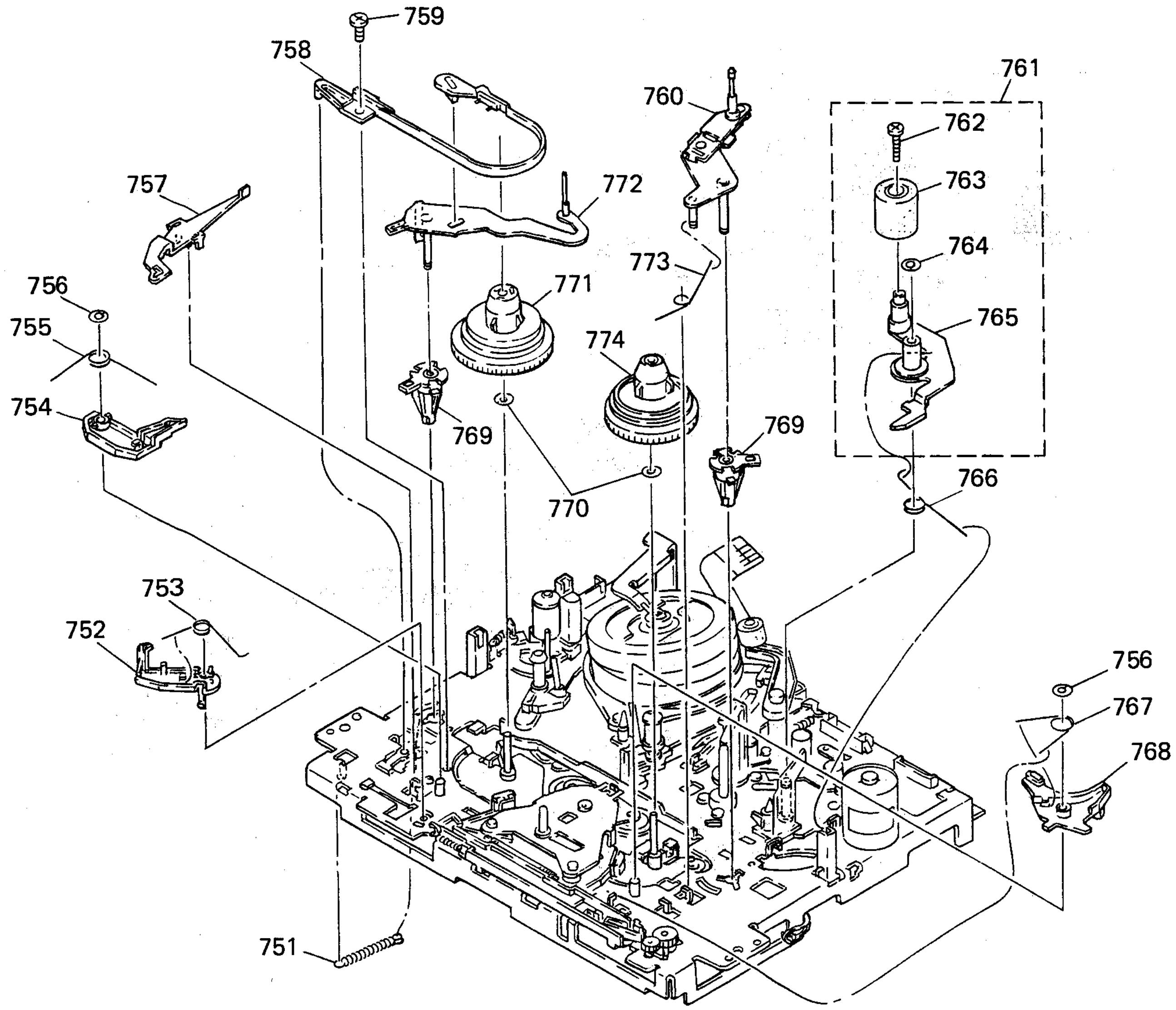
Ref. No.	Part No.	Description	Remark
* 56	A-6727-577-A	PD-47 BOARD, COMPLETE (E40UX)	
* 57	3-957-880-01	PLATE, JACK (PAL), REAR (E40UX)	
* 57	3-957-880-11	PLATE, JACK (PAL), REAR (E40IT)	
* 57	3-957-880-21	PLATE, JACK (PAL), REAR (E40ES)	
58	1-751-794-21	CABLE, FFC (FMD-5)	
* 59	A-6754-700-A	EU-1 BOARD, COMPLETE	
⚠F101	1-576-228-11	FUSE (H.B.C) 2A 250V	

5-1-3. FL CASSETTE COMPARTMENT ASSEMBLY


#21
708
#21
705
706
709
701
707
#22
710
711
704
703
712
714
713
715
702
717
716
not
supplied
721
720
722
718
#22
719

Ref. No.	Part No.	Description	Remark
701	3-946-965-01	FL ASSY	
702	3-946-983-01	GEAR ASSY, SYNCHRO	
703	3-946-993-01	ANGLE, FRONT	
704	3-946-994-01	GUIDE (L), CASSETTE	
705	3-946-978-01	FRAME (L) ASSY	
706	3-947-010-01	GEAR (L) ASSY, LIFT	
707	3-947-009-01	RIVETING, FRAME (L)	
708	3-946-995-01	PLATE, UPPER	
709	3-947-008-01	ANGLE, REAR	
710	3-946-979-01	HOLDER ASSY, CASSETTE	
711	3-947-011-01	FRAME (R)	
712	3-946-991-01	LEVER ASSY, SWITCH	
713	3-946-980-01	WHEEL ASSY, WORM	
714	3-946-992-01	PWB (B) ASSY, FL	
715	3-946-990-01	COVER ASSY, FRAME	
716	3-947-013-01	COVER, FRAME	
717	3-947-020-01	BEARING (A), F WORM	
718	3-948-705-01	COLLAR	
719	3-948-706-01	SCREW (3X6)	
720	3-946-981-01	ARM ASSY, SWITCH	
721	3-946-982-01	GEAR (R) ASSY, LIFT	
722	3-947-012-01	LEVER ASSY, LIFT	

5-1-4. MECHANISM CHASSIS ASSEMBLY (1)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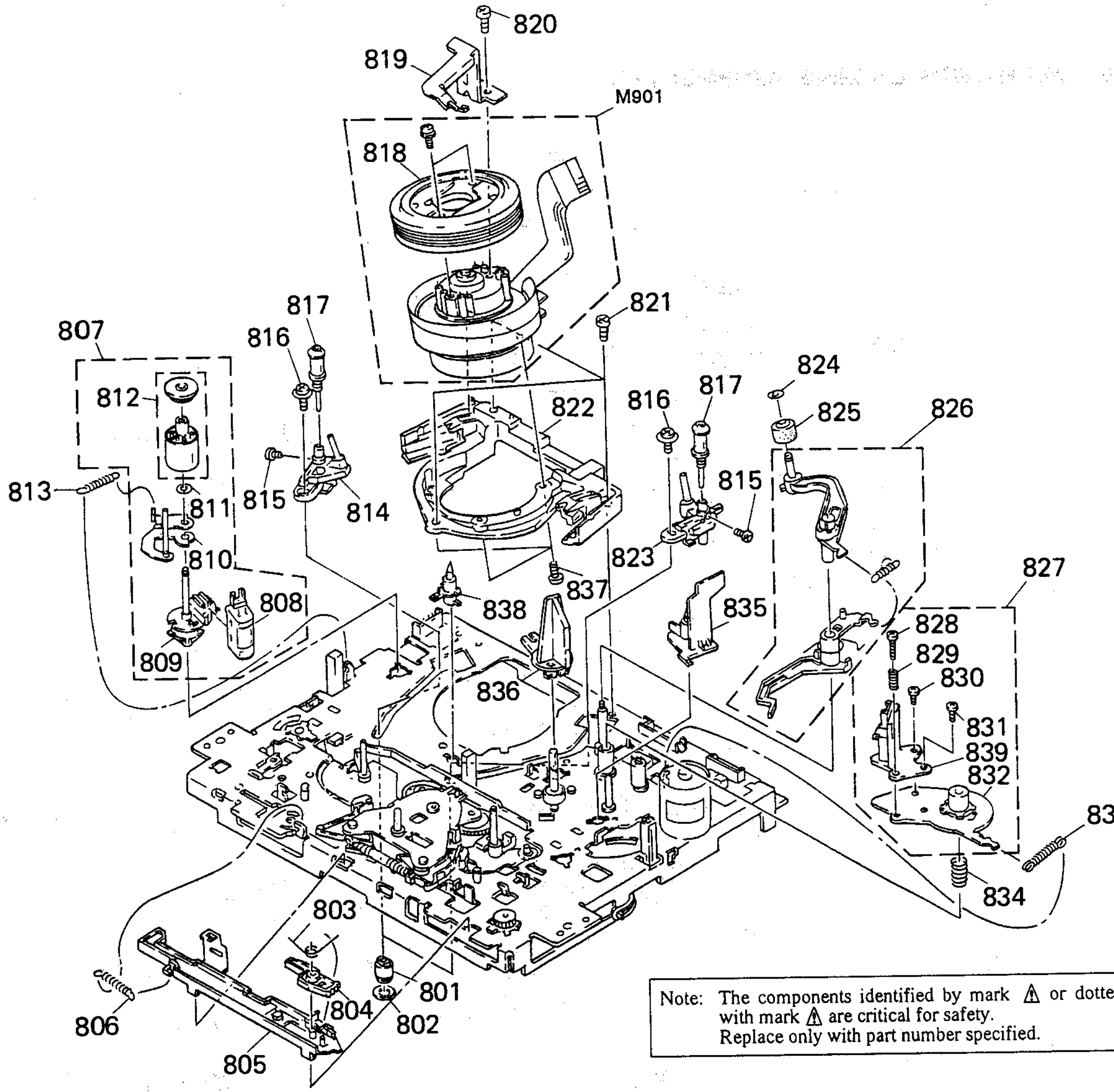
Ref. No.	Part No.	Description	Remark
751	3-946-937-01	SPRING, BT	
752	3-946-959-01	ARM, REC	
753	3-946-947-01	SPRING, REC ARM	
754	3-946-914-01	ARM, SS BRAKE	
755	3-946-915-01	SPRING, SS ARM	
756	3-946-916-01	CUT (3X6X0.5), HLW	
757	3-946-946-01	ARM, REC SWITCH	
758	3-946-935-01	BAND ASSY, BT	
759	3-946-966-01	SCREW (2.6X5), +C TIGHT	
760	3-947-021-01	ARM ASSY, RG	
761	3-947-004-01	ARM ASSY, P ROLLER	
762	3-947-007-01	SCREW (2.6X4), + BIND	
763	3-947-005-01	PINCH ROLLER	
764	3-947-024-01	HL (C) (3.5X5.5X0.5)	
765	3-947-006-01	RIVETING, P ROLLER ARM	
766	3-947-025-01	SPRING, P ARM	
767	3-946-913-01	SPRING, TS ARM	
768	3-946-912-01	ARM ASSY, TS BRAKE	
769	3-946-936-01	METAL, BT ARM	
770	3-947-003-01	WASHER (2.5X4.5X0.5)	
771	3-947-997-01	TABLE ASSY, S REEL	
772	3-946-934-01	ARM ASSY, TENSION	
773	3-947-022-01	SPRING, RG ARM	
774	3-947-002-01	TABLE ASSY, T REEL	

5-1-5. MECHANISM CHASSIS ASSEMBLY (2)

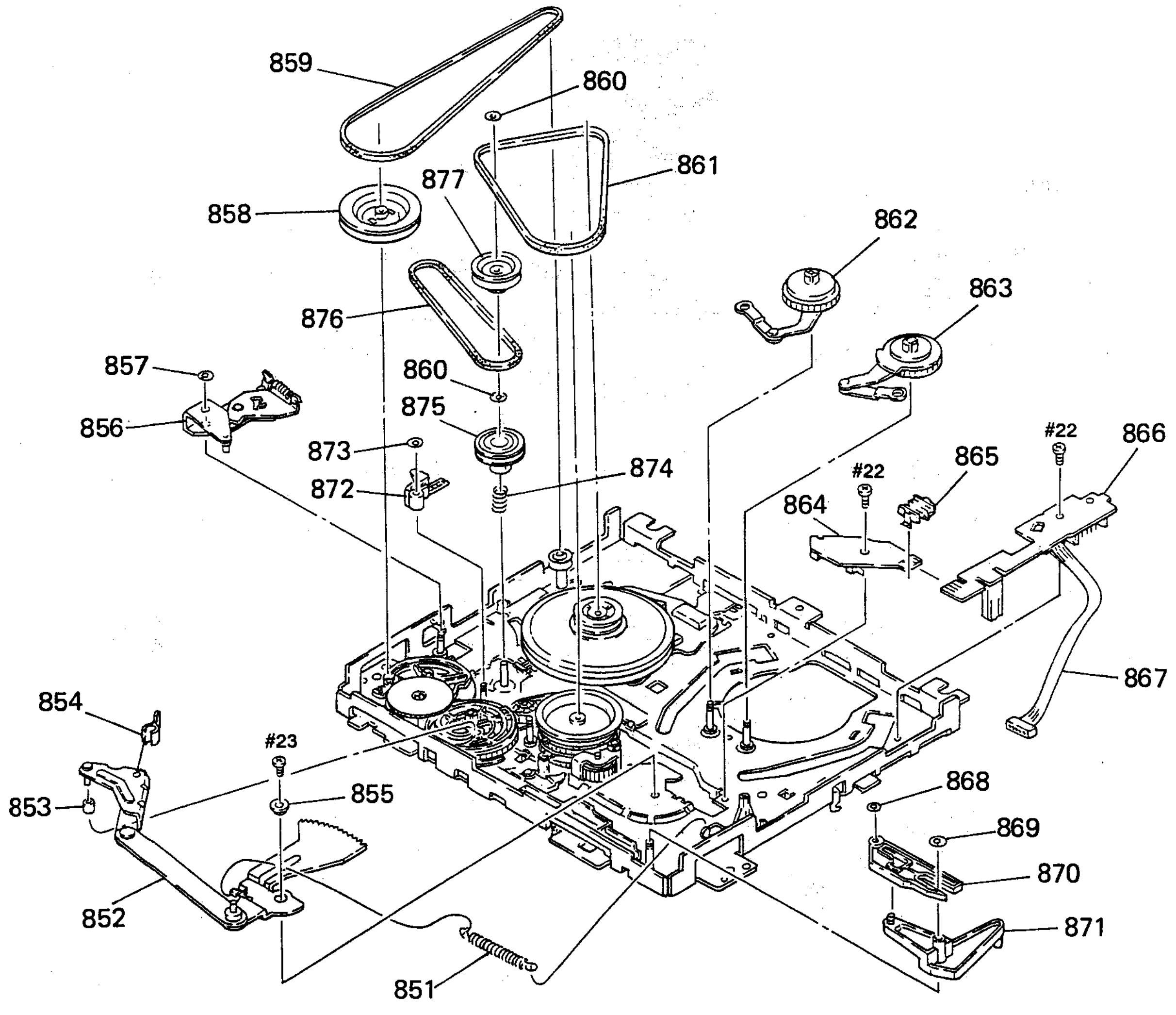


Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
801	3-947-077-01	BOSS, LOADING	
802	3-947-079-01	HL (C) (4.7X7X0.5)	
803	3-947-016-01	SPRING, TRIGGER HOOK	
804	3-947-014-01	HOOK, BK TRIGGER	
805	3-947-001-01	PLATE, SLIDE, BK	
806	3-947-015-01	SPRING, BK SLIDE	
807	3-946-972-01	FE (BASE) ASSY	
808	3-946-973-01	HEAD (HV113001), FE	
809	3-946-974-01	HEAD (HVFHG0003), FE	
810	3-946-976-01	ARM ASSY, F POST	
811	3-946-977-01	CUT (1.6X3.8X0.3), W	
812	3-946-975-01	ROLLER ASSY, IMPEDANCE	
813	3-948-474-01	SPRING, F POST	
814	3-947-071-01	L BLOCK (L) ASSY	
815	3-947-074-01	SCREW (2X2.3)	
816	3-947-078-01	SCREW (2.6X3), +CUP	
817	3-947-073-01	POST, ROLLER	
818	8-848-540-01	UPPER DRUM ASSY (DZR-21-R)	
819	3-949-180-01	GROUND ASSY, SD	
820	3-949-182-01	SCREW (2.6X5), +C TIGHT	

Ref. No.	Part No.	Description	Remark
821	3-947-066-01	SCREW (3X7), +C TIGHT	
822	3-949-179-01	BASE ASSY, CYLINDER	
823	3-947-072-01	L BLOCK (R) ASSY	
824	3-947-625-01	CUT(2.1X5X0.3), POLY-SLIDER(W)	
825	3-947-624-01	ROLLER, CLEANING	
826	3-947-080-01	LEVER ASSY, CLEANING	
827	3-947-081-01	AH (BASE) ASSY	
828	3-946-928-01	SCREW, AZIMUTH SP	
829	3-947-083-01	SP, AZIMUTH	
830	3-946-930-01	SCREW (2.6X7), + PAN	
831	3-946-929-01	SCREW (3X6), PAN	
832	3-946-931-01	HOLDER ASSY, AH (BASE)	
833	3-946-932-01	SPRING, X ADJ	
834	3-946-933-01	SPRING, AH (BASE)	
835	3-947-069-01	GUIDE BLOCK	
836	3-947-068-01	GUIDE ASSY, TAPE	
837	3-949-181-01	SCREW (3X8), + PAN	
838	3-947-070-01	BISS, CASSETTE GUIDE	
839	3-947-082-01	HEAD (HVMZA1136), ACE	
⚠M901	8-848-597-11	DRUM ASSY (DZH-48A-R)	

5-1-6. MECHANISM CHASSIS ASSEMBLY (3)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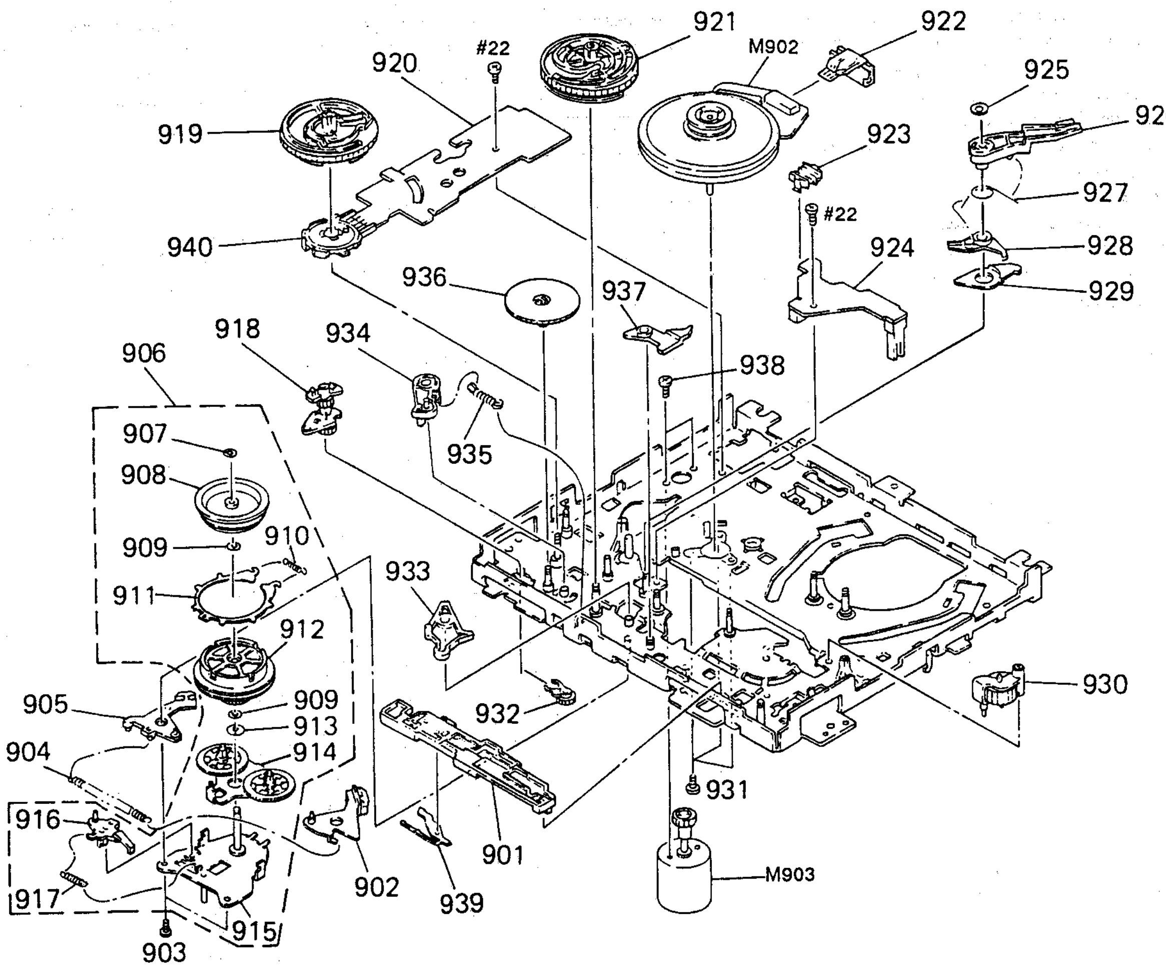
Ref. No.	Part No.	Description	Remark
851	3-946-927-01	SPRING, L GR PLATE	
852	3-946-926-01	RIVETING, L JOINT PLATE	
853	3-946-941-01	ROLLER, CAM	
854	3-946-945-01	STOPPER, L LEVER	
855	3-946-940-01	COLLAR, L GEAR PLATE	
856	3-947-026-01	PLATE ASSY	
857	3-947-027-01	CUT (3X6X0.5), HLW	
858	3-946-921-01	PULLEY, LOADING	
859	3-946-923-01	BELT, LOADING	
860	3-946-963-01	CUT (2.1X4X0.4)	
861	3-946-999-01	BELT, DRIVE	
862	3-947-075-01	GEAR (L) ASSY, T THREADING	
863	3-947-076-01	GEAR (R) ASSY, T THREADING	
864	3-946-956-01	PWB ASSY, S SENSOR	

Ref. No.	Part No.	Description	Remark
865	3-946-948-01	JOINER (MCN40011), PWB	
866	3-949-184-01	PWB (B) ASSY, DM	
867	3-949-190-01	WIRE ASSY, DM	
868	3-946-967-01	CUT (2.1X4X0.5)	
869	3-946-968-01	CUT (3X7.5X0.5), HLW	
870	3-946-939-01	PLATE, UP, BT PULL	
871	3-946-938-01	LEVER, BT	
872	3-946-961-01	ARM, BREAKER	
873	3-946-964-01	CUT (2.1X5X0.5)	
874	3-946-960-01	SPRING, BREAKER	
875	3-946-951-01	PULLEY, EJECT	
876	3-946-962-01	BELT, FL	
877	3-946-950-01	PULLEY ASSY, RE	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1-7. MECHANISM CHASSIS ASSEMBLY (4)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Ref. No.	Part No.	Description	Remark
901	3-946-943-01	PLATE, SLIDE, M	
902	3-947-017-01	ARM (L) ASSY, BRAKE	
903	3-947-000-01	SCREW (2X4), +	
904	3-947-019-01	SPRING, BRAKE ARM	
905	3-947-018-01	ARM (R) ASSY, BRAKE	
906	3-951-590-01	PLATE ASSY, SUB	
907	3-946-996-01	CUT (2.1X5X0.3), P.W.	
908	3-946-984-01	PULLEY ASSY, CLUTCH	
909	3-946-997-01	HL (W) (2.5X4.5X0.25)	
910	3-946-986-01	SPRING, CHANGE RING	
911	3-946-985-01	RING, CHANGE	
912	3-951-591-01	CLUTCH ASSY	
913	3-946-989-01	HL (W) (C) (6.4X9X0.3)	
914	3-946-988-01	PLATE ASSY, GEAR	
915	3-952-168-01	RIVETING, SUB PLATE	
916	3-946-987-01	ARM, CENTER RING	
917	3-947-998-01	SPRING, CENTER RING ARM	
918	3-946-919-01	METAL ASSY, L PULLEY	
919	3-946-924-01	GEAR, P CAM	
920	3-946-954-01	PWB ASSY, BASE	
921	3-946-925-01	GEAR, L CAM	
922	3-947-029-01	LEAD ASSY, CM	
923	3-946-948-01	JOINER (MCN40011), PWB	
924	3-946-955-01	PWB ASSY, T SENSOR	
925	3-947-035-01	CUT (2.6X6X0.5)	
926	3-947-033-01	LEVER, CB RETURN	
927	3-947-031-01	SPRING, C BRAKE	
928	3-947-032-01	LEVER, C BRAKE	
929	3-947-030-01	ARM ASSY, C BRAKE	
930	3-946-998-01	ARM ASSY, RF GEAR	
931	3-947-034-01	SCREW (2.6X7), + C TIGHT	
932	3-946-920-01	ARM ASSY, TRG GEAR	
933	3-946-942-01	LEVER, M	
934	3-946-910-01	ARM, BK RELEASE	
935	3-946-911-01	SPRING, RESET	
936	3-946-922-01	GEAR, LOADING	
937	3-946-952-01	STOPPER, GEAR PLATE	
938	3-946-918-01	SCREW (3X4)	
939	3-946-944-01	LEVER	
940	3-946-958-01	SWITCH, MODE	
⚠M902	3-947-028-01	MOTOR (F2QKB38) (CAPSTAN)	
M903	3-946-917-01	MOTOR ASSY, L (LOADING)	

EU-1 **HI-2**

5-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u:μ, for example:
  uA ..: μA.. uPA..: μPA..
  uPB..: μPB.. uPC..: μPC.. uPD..: μPD..
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref.No.	Part No.	Description	Remark
*	A-6754-700-A	EU-1 BOARD, COMPLETE *********************	
		(Ref.No. 4,000Series)	
		< CONNECTOR >	
CN501	1-506-486-11	PIN, CONNECTOR 7P	
		< JACK >	
CNJ501	1-561-534-41	SOCKET, PIN 21P	
		< JUMPER RESISTOR >	
JR501	1-216-296-00	METAL CHIP 0 5% 1/8W	
		< RESISTOR >	
R501	1-216-041-00	METAL CHIP 470 5% 1/10W	
R502	1-249-413-11	CARBON 470 5% 1/4W	F
R503	1-216-043-00	METAL CHIP 560 5% 1/10W	
**			
*	A-6727-550-A	HI-2 BOARD, COMPLETE *********************	
		(Ref.No. 3,000Series)	
*	3-957-206-01	HOLDER, LCD	
*	3-957-230-01	ILLUMINATOR	
	3-697-607-01	HOLDER, LED	
*	3-957-904-01	REFLECTOR, LCD	
		< CAPACITOR >	
C001	1-124-584-00	ELECT 100uF 20% 10V	
C004	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C005	1-126-157-11	ELECT 10uF 20% 16V	
C006	1-124-584-00	ELECT 100uF 20% 10V	
		< FILTER >	
CF001	1-577-101-11	VIBRATOR, CERAMIC	

Ref.No.	Part No.	Description	Remark
		< CONNECTOR >	
CN001	1-695-820-11	CONNECTOR, BOARD TO BOARD 12P	
CN002	1-569-264-11	CONNECTOR, FPC (ZIF TYPE) 8P	
		< DIODE >	
D001	8-719-911-19	DIODE 1SS119	
D002	8-719-911-19	DIODE 1SS119	
D003	8-719-911-19	DIODE 1SS119	
D004	8-719-911-19	DIODE 1SS119	
D005	8-719-940-99	LED SLR34VC3	
D006	8-719-940-99	LED SLR34VC3	
D007	8-719-047-06	DIODE SEL3713K-TP5	
D008	8-719-047-06	DIODE SEL3713K-TP5	
D009	8-719-047-06	DIODE SEL3713K-TP5	
D010	8-719-047-06	DIODE SEL3713K-TP5	
D011	8-719-109-93	DIODE RD6.2ES-B2	
D012	8-719-109-93	DIODE RD6.2ES-B2	
D013	8-719-109-93	DIODE RD6.2ES-B2	
D014	8-719-109-93	DIODE RD6.2ES-B2	
D015	8-719-109-93	DIODE RD6.2ES-B2	
D016	8-719-109-93	DIODE RD6.2ES-B2	
D017	8-719-109-93	DIODE RD6.2ES-B2	
D018	8-719-109-93	DIODE RD6.2ES-B2	
		< IC >	
IC001	8-759-199-25	IC uPD75304GF-337-3B9	
		< JUMPER RESISTOR >	
JR001	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR002	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR003	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR004	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR005	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR006	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR007	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR010	1-216-296-00	METAL CHIP 0 5% 1/8W	

Ref. No.	Part No.	Description	Remark
		< COIL >	
L001	1-410-526-11	INDUCTOR 10uH	
		< LIQUID CRYSTAL DISPLAY >	
LCD001	1-810-409-21	DISPLAY PANEL, LIQUID CRYSTAL	
		< PILOT LAMP >	
PL001	1-517-254-11	LAMP, PILOT	
PL002	1-517-254-11	LAMP, PILOT	
PL003	1-517-254-11	LAMP, PILOT	
		< TRANSISTOR >	
Q002	8-729-902-99	TRANSISTOR DTC114TK	
Q003	8-729-018-99	TRANSISTOR 2SD2394-F	
Q004	8-729-422-37	TRANSISTOR 2SB709A-R	
		< RESISTOR >	
R005	1-216-025-00	METAL CHIP 100 5% 1/10W	
R006	1-247-807-31	CARBON 100 5% 1/4W	
R007	1-247-807-31	CARBON 100 5% 1/4W	
R008	1-247-807-31	CARBON 100 5% 1/4W	
R009	1-247-807-31	CARBON 100 5% 1/4W	
R010	1-247-807-31	CARBON 100 5% 1/4W	
R011	1-216-025-00	METAL CHIP 100 5% 1/10W	
R012	1-216-025-00	METAL CHIP 100 5% 1/10W	
R013	1-216-025-00	METAL CHIP 100 5% 1/10W	
R014	1-216-025-00	METAL CHIP 100 5% 1/10W	
R015	1-216-174-00	METAL GLAZE 100 5% 1/8W	
R020	1-216-174-00	METAL GLAZE 100 5% 1/8W	
R021	1-216-174-00	METAL GLAZE 100 5% 1/8W	
R023	1-249-411-11	CARBON 330 5% 1/4W	
R024	1-249-411-11	CARBON 330 5% 1/4W	
R036	1-249-409-11	CARBON 220 5% 1/4W	F
R038	1-216-222-00	METAL GLAZE 10K 5% 1/8W	
R039	1-216-172-00	METAL CHIP 82 5% 1/8W	
R040	1-216-172-00	METAL CHIP 82 5% 1/8W	
R041	1-249-409-11	CARBON 220 5% 1/4W	F
R042	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R043	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R044	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R045	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R046	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R047	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R048	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	

Ref. No.	Part No.	Description	Remark
		< SWITCH >	
S001	1-571-977-11	SWITCH, TACTIL (PAUSE)	
S002	1-692-840-21	SWITCH, ROTARY (PLAY/STOP/FF/REW)	
**			
*	A-6782-312-A	MA-200 BOARD, COMPLETE (E40UX) ***********************	
*	A-6782-313-A	MA-200 BOARD, COMPLETE (E40ES) ***********************	
*	A-6782-341-A	MA-200 BOARD, COMPLETE (E40IT) ************************	
		(Ref. No. 2,000Series)	
	1-533-293-11	FUSE HOLDER	
		< CAPACITOR >	
⚠C101	1-104-706-11	FILM 0.22uF 20% 250V	
⚠C102	1-104-705-11	FILM 0.1uF 20% 250V	
⚠C103	1-107-405-11	ELECT 68uF 20% 400V	
⚠C104	1-161-741-00	CERAMIC 0.001uF 10% 400V	
⚠C105	1-161-741-00	CERAMIC 0.001uF 10% 400V	
⚠C106	1-161-741-00	CERAMIC 0.001uF 10% 400V	
⚠C107	1-161-741-00	CERAMIC 0.001uF 10% 400V	
⚠C108	1-161-741-00	CERAMIC 0.001uF 10% 400V	
C121	1-124-480-11	ELECT 470uF 20% 25V	
C122	1-124-472-11	ELECT 470uF 20% 10V	
C123	1-126-101-11	ELECT 100uF 20% 16V	
C124	1-124-589-11	ELECT 47uF 20% 16V	
C125	1-124-477-11	ELECT 47uF 20% 25V	
C126	1-124-477-11	ELECT 47uF 20% 25V	
C181	1-124-589-11	ELECT 47uF 20% 16V	
C182	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C183	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C184	1-124-907-11	ELECT 10uF 20% 50V	
C185	1-124-907-11	ELECT 10uF 20% 50V	
C186	1-124-907-11	ELECT 10uF 20% 50V	
C187	1-124-907-11	ELECT 10uF 20% 50V	
C301	1-104-695-11	FILM 330PF 5% 100V	
C302	1-163-011-11	CERAMIC CHIP 0.0015uF 10% 50V	
C303	1-104-696-11	FILM 0.015uF 5% 100V	
C304	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C305	1-124-120-11	ELECT 220uF 20% 25V	
C306	1-124-242-00	ELECT 33uF 20% 25V	
C307	1-104-792-51	ELECT 33uF 20% 16V	
C308	1-163-023-00	CERAMIC CHIP 0.015uF 5% 50V	
C309	1-126-160-11	ELECT 1uF 20% 50V	
C310	1-104-760-11	CERAMIC CHIP 0.047uF 10% 50V	
C311	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

MA-200

Ref. No.	Part No.	Description		Remark	
C312	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C313	1-124-465-00	ELECT	0.47uF	20%	50V
C314	1-124-261-00	ELECT	10uF	20%	50V
C315	1-130-483-00	MYLAR	0.01uF	5%	50V
C316	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C317	1-126-301-11	ELECT	1uF	20%	50V
C319	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C320	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C321	1-126-157-11	ELECT	10uF	20%	16V
C322	1-124-257-00	ELECT	2.2uF	20%	50V
C323	1-163-007-11	CERAMIC CHIP	680PF	10%	50V
C401	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C402	1-126-101-11	ELECT	100uF	20%	16V
C403	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C404	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C405	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C406	1-124-261-00	ELECT	10uF	20%	50V
C407	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C408	1-124-598-11	ELECT	22uF	20%	25V
C409	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C410	1-124-598-11	ELECT	22uF	20%	25V
C411	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C412	1-130-486-00	MYLAR	0.018uF	10%	50V
C413	1-130-489-00	MYLAR	0.033uF	5%	50V
C414	1-126-163-11	ELECT	4.7uF	20%	50V
C415	1-124-261-00	ELECT	10uF	20%	50V
C417	1-124-589-11	ELECT	47uF	20%	16V
C418	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C419	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C420	1-126-177-11	ELECT	100uF	20%	10V
C421	1-124-598-11	ELECT	22uF	20%	25V
C422	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C423	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C425	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C426	1-124-257-00	ELECT	2.2uF	20%	50V
C427	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C430	1-126-163-11	ELECT	4.7uF	20%	50V
C431	1-124-589-11	ELECT	47uF	20%	16V
C432	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C440	1-124-907-11	ELECT	10uF	20%	50V
C470	1-124-261-00	ELECT	10uF	20%	50V
C480	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C481	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C501	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C502	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C503	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C505	1-126-177-11	ELECT	100uF	20%	10V
C506	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C507	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C508	1-104-905-11	CAP, DOUBLE LAYERS	0.22F		
C509	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C510	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C511	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C512	1-124-472-11	ELECT	470uF	20%	10V
C513	1-124-589-11	ELECT	47uF	20%	16V
C514	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C515	1-124-589-11	ELECT	47uF	20%	16V
C516	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C519	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C520	1-124-589-11	ELECT	47uF	20%	16V
C524	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C550	1-163-189-00	CERAMIC CHIP	220PF	10%	50V
C601	1-126-154-11	ELECT	47uF	20%	6.3V
C602	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C603	1-163-234-11	CERAMIC CHIP	20PF	5%	50V
C604	1-163-234-11	CERAMIC CHIP	20PF	5%	50V
C606	1-126-157-11	ELECT	10uF	20%	16V
C607	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C608	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C609	1-126-154-11	ELECT	47uF	20%	6.3V
C610	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C617	1-163-119-00	CERAMIC CHIP	120PF	5%	50V
C618	1-126-160-11	ELECT	1uF	20%	50V
C620	1-130-481-00	MYLAR	0.0068uF	5%	50V
C621	1-126-160-11	ELECT	1uF	20%	50V
C622	1-130-487-00	MYLAR	0.022uF	5%	50V
C623	1-124-465-00	ELECT	0.47uF	20%	50V
C624	1-163-102-00	CERAMIC CHIP	24PF	5%	50V
C625	1-163-097-00	CERAMIC CHIP	15PF	5%	50V (E40UX/E40ES)
C627	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C630	1-126-154-11	ELECT	47uF	20%	6.3V
C703	1-124-126-00	ELECT	47uF	20%	10V
C705	1-124-443-00	ELECT	100uF	20%	10V
C706	1-124-927-11	ELECT	4.7uF	20%	100V
C707	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C709	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C711	1-126-101-11	ELECT	100uF	20%	16V
C717	1-124-261-00	ELECT	10uF	20%	50V
C722	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
C725	1-124-472-11	ELECT	470uF	20%	10V
C726	1-124-477-11	ELECT	47uF	20%	25V
C732	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C756	1-162-286-31	CERAMIC	220PF	10%	50V
C801	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C852	1-124-638-11	ELECT	22uF	20%	10V
C853	1-126-154-11	ELECT	47uF	20%	6.3V

Ref. No.	Part No.	Description	Remark
C854	1-124-638-11	ELECT 22uF 20%	10V
		< CONNECTOR >	
⚠CN101	1-251-134-11	INLET, AC (NONPOLAR)	
* CN301	1-560-891-00	PIN, CONNECTOR 3P	
* CN302	1-560-892-00	PIN, CONNECTOR 4P	
* CN303	1-560-891-00	PIN, CONNECTOR 3P	
CN402	1-691-057-21	HOUSING, CONNECTOR 25P	
* CN406	1-560-891-00	PIN, CONNECTOR 3P	
* CN407	1-560-891-00	PIN, CONNECTOR 3P	
* CN501	1-695-823-11	CONNECTOR, BOARD TO BOARD 8P	
CN502	1-695-821-11	CONNECTOR, BOARD TO BOARD 12P	
* CN503	1-565-439-11	PIN, CONNECTOR (PCB) 10P (E40UX)	
CN703	1-573-130-21	PIN, CONNECTOR 7P	
CN801	1-573-846-11	CONNECTOR, BOARD TO BOARD 14P	
CN802	1-573-852-11	CONNECTOR, BOARD TO BOARD 20P	
		< COMPOSITION CIRCUIT BLOCK >	
⚠CP101	1-413-897-11	POWER BLOCK (E40ES/E40IT)	
⚠CP101	1-413-940-11	POWER BLOCK (E40UX)	
		< TRIMMER >	
CT601	1-141-334-11	CAP, VAR, TRIMMER	
		< DIODE >	
⚠D101	8-719-510-06	DIODE S1WB60	
⚠D121	8-719-200-82	DIODE 11ES2	
D122	8-719-109-85	DIODE RD5.1ES-B2	
D123	8-719-911-19	DIODE 1SS119	
D181	8-719-911-19	DIODE 1SS119	
D182	8-719-911-19	DIODE 1SS119	
D183	8-719-911-19	DIODE 1SS119	
D184	8-719-911-19	DIODE 1SS119	
D301	8-719-911-19	DIODE 1SS119	
D302	8-719-911-19	DIODE 1SS119	
D304	8-719-911-19	DIODE 1SS119	
D351	8-719-109-85	DIODE RD5.1ES-B2	
D401	8-719-911-19	DIODE 1SS119	
D402	8-719-101-50	DIODE RD5.1E-L2	
D450	8-719-109-93	DIODE RD6.2ES-B2	
D451	8-719-109-93	DIODE RD6.2ES-B2	
D501	8-719-911-19	DIODE 1SS119	
⚠D502	8-719-200-82	DIODE 11ES2	
⚠D503	8-719-200-82	DIODE 11ES2	
D550	8-719-109-93	DIODE RD6.2ES-B2	
D551	8-719-911-19	DIODE 1SS119	
D601	8-719-911-19	DIODE 1SS119	
D603	8-719-911-19	DIODE 1SS119	

Ref. No.	Part No.	Description	Remark
⚠D703	8-719-800-76	DIODE 1SS226	
D704	8-719-110-78	DIODE RD33ES-B2	
D705	8-719-109-74	DIODE RD4.3ES-B1	
D707	8-719-108-12	DIODE RD9.1E-W	
D708	8-719-108-12	DIODE RD9.1E-W	
D709	8-719-110-36	DIODE RD13ES-B2	
D720	8-719-109-85	DIODE RD5.1ES-B2	
D750	8-719-108-12	DIODE RD9.1E-W	
D751	8-719-108-12	DIODE RD9.1E-W	
		< FUSE >	
⚠F101	1-576-228-11	FUSE (H.B.C.)	
		< IC >	
⚠IC121	8-759-189-48	IC PQ12RE11	
⚠IC181	8-759-189-47	IC MC34151DR2	
IC301	8-759-089-82	IC BA7790LS	
⚠IC401	8-759-249-94	IC BA6888N	
IC402	8-759-100-95	IC uPC324G2	
IC403	8-759-908-17	IC TL082CPS	
IC404	8-759-745-64	IC NJM4560M	
IC406	8-759-246-14	IC TA8823N	
IC501	8-752-854-00	IC CXP87248-020Q (E40ES/E40IT)	
IC501	8-752-850-91	IC CXP87248-019Q (E40UX)	
IC504	8-759-044-78	IC AK6420F-SGX2060 (E40ES/E40IT)	
IC504	8-759-159-70	IC BR9021BF-E2 (E40UX)	
IC505	8-759-097-80	IC HD49783FP	
IC507	8-759-248-87	IC MM1256XF-BE	
IC601	8-759-261-79	IC LC74790M-9057	
IC801	8-759-927-56	IC BA7021	
		< JUMPER RESISTOR >	
JR001	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR002	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR003	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR004	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR005	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR006	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR007	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR008	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR009	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR010	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR011	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR012	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR013	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR014	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR401	1-216-295-00	METAL CHIP 0 5% 1/10W	

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MA-200

Ref. No.	Part No.	Description				Remark
JR402	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR503	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR603	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR604	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR705	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR706	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR904	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR905	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR908	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR910	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR914	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR915	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR922	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR923	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR939	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR948	1-216-295-00	METAL CHIP	0	5%	1/10W	
		< COIL >				
L111	1-414-179-21	INDUCTOR 2.2uH				
L121	1-403-588-11	CIL, CHOKE 22uH				
L122	1-403-588-11	CIL, CHOKE 22uH				
L123	1-408-421-00	INDUCTOR 100uH				
L181	1-410-527-11	INDUCTOR 100uH				
L301	1-410-687-11	INDUCTOR 1.2mH				
L302	1-414-189-31	INDUCTOR 100uH				
L303	1-410-071-11	INDUCTOR 10mH				
L351	1-414-146-31	INDUCTOR 2.2uH (E40UX)				
L401	1-408-413-00	INDUCTOR 22uH				
L402	1-408-413-00	INDUCTOR 22uH				
L501	1-410-509-11	INDUCTOR 10uH				
L502	1-414-189-31	INDUCTOR 100uH				
L503	1-410-509-11	INDUCTOR 10uH				
L504	1-410-509-11	INDUCTOR 10uH				
L601	1-414-189-31	INDUCTOR 100uH				
L602	1-414-189-31	INDUCTOR 100uH				
L604	1-410-506-11	INDUCTOR 5.6uH				
L605	1-410-527-11	INDUCTOR 100uH				
L701	1-414-183-41	INDUCTOR 10uH				
L702	1-414-186-31	INDUCTOR 33uH				
L706	1-408-401-00	INDUCTOR 2.2uH				
L708	1-414-189-31	INDUCTOR 100uH				
L712	1-410-500-11	INDUCTOR 1.8uH				
L801	1-414-189-31	INDUCTOR 100uH				
		< LINE FILTER >				
⚠LF101	1-403-599-11	FILTER, LINE 33MH				
⚠LF102	1-403-599-11	FILTER, LINE 33MH				
LF181	1-239-803-11	FILTER, EMI				
		< IC LINK >				
⚠PS121	1-532-675-00	LINK, IC 1.5A				
⚠PS181	1-532-679-00	LINK, IC				
⚠PS301	1-532-727-11	LINK, IC 0.25A				
⚠PS401	1-532-679-00	LINK, IC				
⚠PS450	1-532-727-11	LINK, IC 0.25A				
		< TRANSISTOR >				
⚠Q121	8-729-140-93	TRANSISTOR	2SB733-34			
Q122	8-729-421-22	TRANSISTOR	UN2211			
⚠Q123	8-729-140-98	TRANSISTOR	2SD773-34			
Q301	8-729-012-31	TRANSISTOR	2SC4040-TL2-Q			
Q302	8-729-216-22	TRANSISTOR	2SA1162-G			
Q303	8-729-010-25	TRANSISTOR	MSD601-RT1			
Q304	8-729-010-05	TRANSISTOR	MSB709-RT1			
Q305	8-729-010-25	TRANSISTOR	MSD601-RT1			
Q401	8-729-424-56	TRANSISTOR	UN211L			
Q501	8-729-424-18	TRANSISTOR	UN2113			
Q570	8-729-424-18	TRANSISTOR	UN2113			
Q601	8-729-424-18	TRANSISTOR	UN2113			
Q602	8-729-010-25	TRANSISTOR	MSD601-RT1			
Q604	8-729-010-05	TRANSISTOR	MSB709-RT1			
Q605	8-729-010-05	TRANSISTOR	MSB709-RT1			
Q606	8-729-421-19	TRANSISTOR	UN2213			
Q630	8-729-010-25	TRANSISTOR	MSD601-RT1			
Q701	8-729-010-05	TRANSISTOR	MSB709-RT1			
Q702	8-729-421-19	TRANSISTOR	UN2213			
⚠Q703	8-729-119-76	TRANSISTOR	2SA1175-HFE			
Q712	8-729-119-76	TRANSISTOR	2SA1175-HFE			
Q713	8-729-421-19	TRANSISTOR	UN2213			
Q714	8-729-424-56	TRANSISTOR	UN211L			
		< RESISTOR >				
⚠R101	1-214-947-00	METAL	2.7M	1%	1/2W	
R121	1-249-417-11	CARBON	1K	5%	1/4W	F
⚠R122	1-216-430-11	METAL OXIDE	390	5%	1W	F
R123	1-249-412-11	CARBON	390	5%	1/4W	F
R181	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R182	1-216-073-00	METAL CHIP	10K	5%	1/10W	
⚠R301	1-249-389-11	CARBON	4.7	5%	1/4W	F
R302	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R303	1-249-417-11	CARBON	1K	5%	1/4W	F
R304	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R305	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R306	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R307	1-216-068-00	METAL CHIP	6.2K	5%	1/10W	
R308	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R309	1-216-085-00	METAL CHIP	33K	5%	1/10W	

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Ref. No.	Part No.	Description			Remark
R310	1-216-037-00	METAL CHIP	330	5%	1/10W
R311	1-216-083-00	METAL CHIP	27K	5%	1/10W
R312	1-216-083-00	METAL CHIP	27K	5%	1/10W
R313	1-216-041-00	METAL CHIP	470	5%	1/10W
R314	1-216-095-00	METAL CHIP	82K	5%	1/10W
R315	1-216-097-00	METAL CHIP	100K	5%	1/10W
R316	1-216-035-00	METAL CHIP	270	5%	1/10W
R317	1-216-109-00	METAL CHIP	330K	5%	1/10W
R318	1-216-074-00	METAL CHIP	11K	5%	1/10W
R319	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R320	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R321	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R322	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R323	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R325	1-216-091-00	METAL CHIP	56K	5%	1/10W
R326	1-216-091-00	METAL CHIP	56K	5%	1/10W
R327	1-216-068-00	METAL CHIP	6.2K	5%	1/10W
R328	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R331	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R332	1-216-089-00	METAL CHIP	47K	5%	1/10W
R333	1-216-073-00	METAL CHIP	10K	5%	1/10W
R334	1-216-095-00	METAL CHIP	82K	5%	1/10W
R335	1-249-435-11	CARBON	33K	5%	1/4W
R336	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R337	1-216-049-00	METAL CHIP	1K	5%	1/10W
R363	1-216-001-00	METAL CHIP	10	5%	1/10W
R401	1-216-097-00	METAL CHIP	100K	5%	1/10W
R402	1-216-097-00	METAL CHIP	100K	5%	1/10W
R403	1-216-033-00	METAL CHIP	220	5%	1/10W
R404	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R405	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R406	1-216-089-00	METAL CHIP	47K	5%	1/10W
R407	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R408	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R409	1-216-089-00	METAL CHIP	47K	5%	1/10W
R410	1-208-806-11	METAL GLAZE	10K	0.50%	1/10W
R410	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R411	1-208-798-11	METAL GLAZE	4.7K	0.50%	1/10W
R411	1-216-667-11	METAL CHIP	4.7K	0.5%	1/10W
R412	1-208-804-11	METAL GLAZE	8.2K	0.50%	1/10W
R412	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W
R413	1-208-802-11	METAL GLAZE	6.8K	0.50%	1/10W
R413	1-216-671-11	METAL CHIP	6.8K	0.5%	1/10W
R414	1-216-081-00	METAL CHIP	22K	5%	1/10W
R415	1-216-083-00	METAL CHIP	27K	5%	1/10W
R416	1-216-103-91	METAL GLAZE	180K	5%	1/10W
R417	1-216-079-00	METAL CHIP	18K	5%	1/10W
R418	1-216-049-00	METAL CHIP	1K	5%	1/10W
R419	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R420	1-216-077-00	METAL CHIP	15K	5%	1/10W
R421	1-216-113-00	METAL CHIP	470K	5%	1/10W
R422	1-216-073-00	METAL CHIP	10K	5%	1/10W
R423	1-216-073-00	METAL CHIP	10K	5%	1/10W
R424	1-216-073-00	METAL CHIP	10K	5%	1/10W
R425	1-216-073-00	METAL CHIP	10K	5%	1/10W
R426	1-216-077-00	METAL CHIP	15K	5%	1/10W
R427	1-216-073-00	METAL CHIP	10K	5%	1/10W
R428	1-216-073-00	METAL CHIP	10K	5%	1/10W
R429	1-216-073-00	METAL CHIP	10K	5%	1/10W
R435	1-216-093-00	METAL CHIP	68K	5%	1/10W
R436	1-216-119-00	METAL CHIP	820K	5%	1/10W
R437	1-216-097-00	METAL CHIP	100K	5%	1/10W
R438	1-216-097-00	METAL CHIP	100K	5%	1/10W
R439	1-216-085-00	METAL CHIP	33K	5%	1/10W
R440	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R441	1-216-037-00	METAL CHIP	330	5%	1/10W
R443	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R448	1-216-073-00	METAL CHIP	10K	5%	1/10W
R449	1-216-091-00	METAL CHIP	56K	5%	1/10W
R450	1-216-089-00	METAL CHIP	47K	5%	1/10W
R451	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R453	1-216-091-00	METAL CHIP	56K	5%	1/10W
R454	1-249-414-11	CARBON	560	5%	1/4W F
R455	1-216-089-00	METAL CHIP	47K	5%	1/10W
R456	1-216-089-00	METAL CHIP	47K	5%	1/10W
R457	1-216-089-00	METAL CHIP	47K	5%	1/10W
R458	1-216-089-00	METAL CHIP	47K	5%	1/10W
R459	1-216-089-00	METAL CHIP	47K	5%	1/10W
R460	1-216-089-00	METAL CHIP	47K	5%	1/10W
R461	1-216-089-00	METAL CHIP	47K	5%	1/10W
R462	1-216-103-91	METAL GLAZE	180K	5%	1/10W
R470	1-216-089-00	METAL CHIP	47K	5%	1/10W
R471	1-216-089-00	METAL CHIP	47K	5%	1/10W
R501	1-216-001-00	METAL CHIP	10	5%	1/10W
R502	1-216-081-00	METAL CHIP	22K	5%	1/10W
R503	1-216-049-00	METAL CHIP	1K	5%	1/10W
R505	1-216-049-00	METAL CHIP	1K	5%	1/10W
R506	1-216-049-00	METAL CHIP	1K	5%	1/10W
R507	1-216-033-00	METAL CHIP	220	5%	1/10W
R508	1-249-437-11	CARBON	47K	5%	1/4W
R509	1-249-437-11	CARBON	47K	5%	1/4W
R510	1-216-049-00	METAL CHIP	1K	5%	1/10W
R511	1-216-025-00	METAL CHIP	100	5%	1/10W
R512	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R513	1-216-025-00	METAL CHIP	100	5%	1/10W
R517	1-216-089-00	METAL CHIP	47K	5%	1/10W (E40UX)

MA-200 MF-229

Ref. No.	Part No.	Description			Remark
R518	1-216-089-00	METAL CHIP	47K	5%	1/10W (40ES/E40IT)
R521	1-216-150-00	METAL GLAZE	10	5%	1/8W
R522	1-216-109-00	METAL CHIP	330K	5%	1/10W
R523	1-216-113-00	METAL CHIP	470K	5%	1/10W
R524	1-216-113-00	METAL CHIP	470K	5%	1/10W
R526	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R527	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R528	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R529	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R530	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R531	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R532	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R533	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R534	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R535	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R536	1-216-049-00	METAL CHIP	1K	5%	1/10W
R537	1-216-049-00	METAL CHIP	1K	5%	1/10W
R538	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R544	1-216-295-00	METAL CHIP	0	5%	1/10W
R545	1-216-049-00	METAL CHIP	1K	5%	1/10W
R546	1-216-049-00	METAL CHIP	1K	5%	1/10W
R547	1-216-089-00	METAL CHIP	47K	5%	1/10W
R550	1-216-295-00	METAL CHIP	0	5%	1/10W
R551	1-216-295-00	METAL CHIP	0	5%	1/10W
R552	1-216-295-00	METAL CHIP	0	5%	1/10W
R553	1-216-295-00	METAL CHIP	0	5%	1/10W
R554	1-216-295-00	METAL CHIP	0	5%	1/10W
R560	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R561	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R570	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R605	1-216-073-00	METAL CHIP	10K	5%	1/10W
R606	1-216-073-00	METAL CHIP	10K	5%	1/10W
R607	1-216-222-00	METAL GLAZE	10K	5%	1/8W
R608	1-216-066-00	METAL CHIP	5.1K	5%	1/10W
R609	1-216-066-00	METAL CHIP	5.1K	5%	1/10W
R613	1-216-295-00	METAL CHIP	0	5%	1/10W
R614	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R615	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R616	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R617	1-216-049-00	METAL CHIP	1K	5%	1/10W
R618	1-216-045-00	METAL CHIP	680	5%	1/10W
R619	1-216-089-00	METAL CHIP	47K	5%	1/10W
R620	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R621	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R623	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R630	1-216-049-00	METAL CHIP	1K	5%	1/10W
R703	1-216-049-00	METAL CHIP	1K	5%	1/10W
R704	1-216-025-00	METAL CHIP	100	5%	1/10W
R705	1-216-089-00	METAL CHIP	47K	5%	1/10W
R707	1-216-037-00	METAL CHIP	330	5%	1/10W (E40UX/E40IT)
R716	1-216-295-00	METAL CHIP	0	5%	1/10W
R719	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R730	1-216-021-00	METAL CHIP	68	5%	1/10W
R731	1-247-811-31	CARBON	150	5%	1/4W
R732	1-216-017-00	METAL CHIP	47	5%	1/10W
R733	1-249-408-11	CARBON	180	5%	1/4W F
R734	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R735	1-216-023-00	METAL CHIP	82	5%	1/10W
R736	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R737	1-216-049-00	METAL CHIP	1K	5%	1/10W
R738	1-216-295-00	METAL CHIP	0	5%	1/10W
R801	1-216-073-00	METAL CHIP	10K	5%	1/10W
R802	1-216-073-00	METAL CHIP	10K	5%	1/10W
R804	1-216-073-00	METAL CHIP	10K	5%	1/10W

< VARIABLE RESISTOR >

RV301	1-238-019-11	RES, ADJ, CARBON 47K
RV502	1-238-019-11	RES, ADJ, CARBON 47K

< TRANSFORMER >

T301	1-423-414-11	TRANSFORMER, BIAS OSCILLATION

< TUNER >

⚠TU701	1-693-239-11	TUNER, RF MOD/IF (E40ES)
⚠TU701	1-693-240-11	TUNER, RF MOD/IF (E40UX)
⚠TU701	1-693-250-11	TUNER PACK, RF IF (E40IT)

< VIBRATOR >

X501	1-760-239-11	VIBRATOR, CRYSTAL (16MHz)
X502	1-579-463-11	VIBRATOR, CRYSTAL (32.768KHz)
X601	1-577-289-11	VIBRATOR, CRYSTAL (17.744MHz)

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* A-6721-635-A MF-229 BOARD, COMPLETE

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(Ref. No. 3,000Series)

< CONNECTOR >

* CN001	1-695-822-11	CONNECTOR, BOARD TO BOARD 8P

< DIODE >

D001	8-719-940-82	LED	SLR34MC3
D002	8-719-940-82	LED	SLR34MC3
D004	8-719-109-93	DIODE	RD6.2ES-B2
D006	8-719-109-93	DIODE	RD6.2ES-B2
D007	8-719-109-93	DIODE	RD6.2ES-B2

The components identified by
mark ⚠ or dotted line with mark
⚠ are critical for safety.
Replace only with part number
specified.

Ref. No.	Part No.	Description	Remark
D008	8-719-109-93	DIODE RD6.2ES-B2	

< IC >

Ref. No.	Part No.	Description	Remark
IC001	1-466-833-11	IC RAY-CATCHER BLOCK, REMOCON	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q001	8-729-421-22	TRANSISTOR UN2211	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R001	1-216-021-00	METAL CHIP 68 5% 1/10W	

< SWITCH >

Ref. No.	Part No.	Description	Remark
S001	1-571-977-11	SWITCH, TACTIL (POWER)	
S002	1-571-977-11	SWITCH, TACTIL (EJECT)	

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* A-6727-516-A MH-11 BOARD, COMPLETE

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(Ref. No. 1,000Series)

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN301	1-764-271-31	CONNECTOR, BOARD TO BOARD 9P	
CN302	1-764-272-31	CONNECTOR, BOARD TO BOARD 13P	
CN303	1-564-014-11	PIN, CONNECTOR 4P	
CN304	1-691-084-21	HOUSING, CONNECTOR 25P	

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* A-6727-577-A PD-47 BOARD, COMPLETE (E40UX)

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(Ref. No. 4,000Series)

< CAPACITOR >

Ref. No.	Part No.	Description	Remark
C603	1-163-038-11	CERAMIC CHIP 0.1uF 25V	
C604	1-124-589-11	ELECT 47uF 20% 16V	
C605	1-163-227-11	CERAMIC CHIP 10PF 0.5PF 50V	
C606	1-163-227-11	CERAMIC CHIP 10PF 0.5PF 50V	
C607	1-163-038-11	CERAMIC CHIP 0.1uF 25V	
C608	1-124-589-11	ELECT 47uF 20% 16V	
C609	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C610	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C611	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C612	1-126-301-11	ELECT 1uF 20% 50V	
C614	1-163-038-11	CERAMIC CHIP 0.1uF 25V	

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
* CN601	1-565-438-11	SOCKET, CONNECTOR (PCB) 10P	

< DIODE >

Ref. No.	Part No.	Description	Remark
D601	8-719-801-48	DIODE 1SS193	
D602	8-719-801-48	DIODE 1SS193	
D604	8-719-911-19	DIODE 1SS119	

< IC >

Ref. No.	Part No.	Description	Remark
IC601	8-752-845-47	IC CXP80316-025Q	
IC602	8-759-168-94	IC MV1820E-CG-MPEE	
IC603	8-759-504-44	IC MM1031XMR	

< JUMPER RESISTOR >

Ref. No.	Part No.	Description	Remark
JR601	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR602	1-216-296-00	METAL CHIP 0 5% 1/8W	

< COIL >

Ref. No.	Part No.	Description	Remark
L601	1-410-521-11	INDUCTOR 100uH	
L602	1-410-509-11	INDUCTOR 10uH	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R601	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R602	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R603	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R604	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R605	1-216-073-00	METAL CHIP 10K 5% 1/10W	

< VIBRATOR >

Ref. No.	Part No.	Description	Remark
X601	1-579-125-11	VIBRATOR, CERAMIC (8MHz)	
X602	1-579-971-11	VIBRATOR, CRYSTAL (27.75MHz)	

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* A-6721-636-A RV-33 BOARD, COMPLETE

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(Ref. No. 1,000Series)

< CAPACITOR >

Ref. No.	Part No.	Description	Remark
C001	1-163-989-11	CERAMIC CHIP 0.033uF 10% 25V	
C002	1-164-699-11	CERAMIC CHIP 0.0033uF 5% 50V	
C003	1-124-465-00	ELECT 0.47uF 20% 50V	
C004	1-163-099-00	CERAMIC CHIP 18PF 5% 50V	
C005	1-163-108-00	CERAMIC CHIP 43PF 5% 50V	
C006	1-124-257-00	ELECT 2.2uF 20% 50V	
C007	1-163-235-11	CERAMIC CHIP 22PF 5% 50V	
C008	1-163-237-11	CERAMIC CHIP 27PF 5% 50V	
C009	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C010	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C011	1-124-463-00	ELECT 0.1uF 20% 50V	
C012	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C013	1-164-161-11	CERAMIC CHIP 0.0022uF 10% 100V	
C014	1-124-465-00	ELECT 0.47uF 20% 50V	

RV-33

Ref. No.	Part No.	Description		Remark	
C015	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C016	1-163-095-00	CERAMIC CHIP	12PF	5%	50V
C017	1-163-083-00	CERAMIC CHIP	1PF		50V
C018	1-126-163-11	ELECT	4.7uF	20%	50V
C019	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C024	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C026	1-126-157-11	ELECT	10uF	20%	16V
C027	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C028	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C029	1-124-465-00	ELECT	0.47uF	20%	50V
C030	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C031	1-124-638-11	ELECT	22uF	20%	10V
C032	1-126-162-11	ELECT	3.3uF	20%	50V
C033	1-124-638-11	ELECT	22uF	20%	10V
C034	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C036	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C038	1-163-087-00	CERAMIC CHIP	4PF		50V
C039	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C040	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C045	1-124-257-00	ELECT	2.2uF	20%	50V
C046	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C047	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C048	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C049	1-163-107-00	CERAMIC CHIP	39PF	5%	50V
C050	1-163-123-00	CERAMIC CHIP	180PF	5%	50V
C051	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C052	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C053	1-124-465-00	ELECT	0.47uF	20%	50V
C055	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C056	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C057	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C058	1-124-465-00	ELECT	0.47uF	20%	50V
C059	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C060	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C061	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C062	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C063	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C064	1-124-638-11	ELECT	22uF	20%	10V
C065	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C066	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C067	1-165-320-11	CERAMIC CHIP	0.47uF	10%	16V
C068	1-163-096-00	CERAMIC CHIP	13PF	5%	50V
C069	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C073	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C075	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C079	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C081	1-163-091-00	CERAMIC CHIP	8PF		50V
C082	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V

Ref. No.	Part No.	Description		Remark	
C083	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C086	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C087	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C093	1-163-104-00	CERAMIC CHIP	30PF	5%	50V
C098	1-124-638-11	ELECT	22uF	20%	10V
C099	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C101	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C102	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C120	1-124-638-11	ELECT	22uF	20%	10V
C121	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C801	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C802	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C803	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C804	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C805	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C806	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C807	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C808	1-124-584-00	ELECT	100uF	20%	10V
C809	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C810	1-124-584-00	ELECT	100uF	20%	10V
C811	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C812	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C813	1-164-336-11	CERAMIC CHIP	0.33uF		25V
C814	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C815	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C816	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C817	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C819	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C822	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C826	1-124-229-00	ELECT	33uF	20%	10V
C827	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C829	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C830	1-163-103-00	CERAMIC CHIP	27PF	5%	50V
C836	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C838	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C839	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C840	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C841	1-163-093-00	CERAMIC CHIP	10PF	5%	50V
C842	1-126-160-11	ELECT	1uF	20%	50V
C843	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C845	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C846	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C901	1-163-091-00	CERAMIC CHIP	8PF		50V
C902	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C903	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C904	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C907	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C908	1-163-031-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description	Remark
C909	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C910	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C911	1-163-243-11	CERAMIC CHIP 47PF 5%	50V
C912	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C913	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C914	1-163-113-00	CERAMIC CHIP 68PF 5%	50V
C916	1-216-295-00	METAL CHIP 0 5%	1/10W
C917	1-163-035-00	CERAMIC CHIP 0.047uF	50V
C920	1-163-121-00	CERAMIC CHIP 150PF 5%	50V
C921	1-124-638-11	ELECT 22uF 20%	10V
C938	1-163-131-00	CERAMIC CHIP 390PF 5%	50V

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN001	1-573-828-11	CONNECTOR, BOARD TO BOARD 14P	
CN002	1-573-834-11	CONNECTOR, BOARD TO BOARD 20P	
CN801	1-563-585-11	CONNECTOR, FLEXIBLE 8P	
* CN802	1-564-029-00	PIN, CONNECTOR 4P	

< DIODE >

Ref. No.	Part No.	Description	Remark
D001	8-719-801-78	DIODE 1SS184	
D801	8-719-801-78	DIODE 1SS184	
D802	8-719-801-78	DIODE 1SS184	
D803	8-719-801-78	DIODE 1SS184	
D901	8-719-951-22	IC IMN10	

< DELAY LINE >

Ref. No.	Part No.	Description	Remark
DL003	1-415-728-21	DELAY LINE, 2H (ULTRASONIC)	
DL003	1-415-728-31	DELAY LINE, 2H (ULTRASONIC)	

< IC >

Ref. No.	Part No.	Description	Remark
IC001	8-759-183-95	IC HA118385FEB	
IC003	8-759-194-24	IC MSM7450MS-K-TP	
IC004	8-759-035-93	IC SC7S32F	
IC801	8-759-267-78	IC HA118191ANT	

< JUMPER RESISTOR >

Ref. No.	Part No.	Description	Remark
JR015	1-216-295-00	METAL CHIP 0 5%	1/10W
JR022	1-216-295-00	METAL CHIP 0 5%	1/10W
JR024	1-216-295-00	METAL CHIP 0 5%	1/10W
JR030	1-216-295-00	METAL CHIP 0 5%	1/10W

< COIL >

Ref. No.	Part No.	Description	Remark
L001	1-408-970-21	INDUCTOR 10uH	
L002	1-408-975-21	INDUCTOR 27uH	
L003	1-408-970-21	INDUCTOR 10uH	
L005	1-408-972-21	INDUCTOR 15uH	
L006	1-408-976-21	INDUCTOR 33uH	
L007	1-408-982-11	INDUCTOR 100uH	
L008	1-408-982-11	INDUCTOR 100uH	
L009	1-408-980-21	INDUCTOR 68uH	
L010	1-408-976-21	INDUCTOR 33uH	
L011	1-408-983-21	INDUCTOR 120uH	
L012	1-408-429-00	INDUCTOR 470uH	
L013	1-408-427-00	INDUCTOR 330uH	
L014	1-408-978-21	INDUCTOR 47uH	
L015	1-408-982-11	INDUCTOR 100uH	
L017	1-408-985-21	INDUCTOR 180uH	
L018	1-408-982-11	INDUCTOR 100uH	
L801	1-408-948-00	INDUCTOR 220uH	
L802	1-408-948-00	INDUCTOR 220uH	
L803	1-408-982-11	INDUCTOR 100uH	
L804	1-408-982-11	INDUCTOR 100uH	
L805	1-408-985-21	INDUCTOR 180uH	
L810	1-408-985-21	INDUCTOR 180uH	
L812	1-408-982-11	INDUCTOR 100uH	
L813	1-408-970-21	INDUCTOR 10uH	
L814	1-408-970-21	INDUCTOR 10uH	
L901	1-408-974-21	INDUCTOR 22uH	
L902	1-408-948-00	INDUCTOR 220uH	
L908	1-408-982-11	INDUCTOR 100uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q001	8-729-010-25	TRANSISTOR MSD601-RT1	
Q002	8-729-010-25	TRANSISTOR MSD601-RT1	
Q003	8-729-010-25	TRANSISTOR MSD601-RT1	
Q004	8-729-010-25	TRANSISTOR MSD601-RT1	
Q005	8-729-421-19	TRANSISTOR UN2213	
Q006	8-729-010-25	TRANSISTOR MSD601-RT1	
Q007	8-729-010-05	TRANSISTOR MSB709-RT1	
Q011	8-729-010-25	TRANSISTOR MSD601-RT1	
Q012	8-729-421-19	TRANSISTOR UN2213	
Q013	8-729-010-25	TRANSISTOR MSD601-RT1	
Q014	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q016	8-729-424-56	TRANSISTOR UN211L	
Q018	8-729-424-18	TRANSISTOR UN2113	
Q021	8-729-421-19	TRANSISTOR UN2213	
Q028	8-729-421-19	TRANSISTOR UN2213	
Q029	8-729-421-19	TRANSISTOR UN2213	
Q030	8-729-421-19	TRANSISTOR UN2213	
Q031	8-729-424-08	TRANSISTOR UN2111	
Q032	8-729-424-90	TRANSISTOR UN221L-TX	
Q033	8-729-424-90	TRANSISTOR UN221L-TX	
Q034	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q040	8-729-421-19	TRANSISTOR UN2213	
Q041	8-729-421-19	TRANSISTOR UN2213	
Q046	8-729-421-19	TRANSISTOR UN2213	
Q047	8-729-421-19	TRANSISTOR UN2213	

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Ref. No.	Part No.	Description	Remark
Q048	8-729-421-19	TRANSISTOR UN2213	
Q049	8-729-421-19	TRANSISTOR UN2213	
Q051	8-729-421-19	TRANSISTOR UN2213	
Q055	8-729-421-19	TRANSISTOR UN2213	
Q810	8-729-421-19	TRANSISTOR UN2213	
Q811	8-729-921-12	TRANSISTOR 2SD1834	
Q815	8-729-421-19	TRANSISTOR UN2213	
Q816	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q817	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q818	8-729-421-19	TRANSISTOR UN2213	
Q819	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q820	8-729-010-25	TRANSISTOR MSD601-RT1	
Q821	8-729-010-25	TRANSISTOR MSD601-RT1	
Q822	8-729-421-19	TRANSISTOR UN2213	
Q839	8-729-421-19	TRANSISTOR UN2213	
Q840	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q841	8-729-216-21	TRANSISTOR 2SA1162Y-TE85L	
Q904	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q906	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q907	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q908	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q909	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q931	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q938	8-729-421-19	TRANSISTOR UN2213	
Q939	8-729-424-08	TRANSISTOR UN2111	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R001	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R002	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R003	1-216-049-00	METAL CHIP 1K 5%	1/10W
R004	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R005	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R006	1-216-049-00	METAL CHIP 1K 5%	1/10W
R007	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R008	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R009	1-216-049-00	METAL CHIP 1K 5%	1/10W
R010	1-216-081-00	METAL CHIP 22K 5%	1/10W
R012	1-216-081-00	METAL CHIP 22K 5%	1/10W
R014	1-216-081-00	METAL CHIP 22K 5%	1/10W
R016	1-216-049-00	METAL CHIP 1K 5%	1/10W
R017	1-216-083-00	METAL CHIP 27K 5%	1/10W
R018	1-216-037-00	METAL CHIP 330 5%	1/10W
R019	1-216-037-00	METAL CHIP 330 5%	1/10W
R024	1-216-035-00	METAL CHIP 270 5%	1/10W
R025	1-216-056-00	METAL GLAZE 2K 5%	1/10W
R027	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R029	1-216-049-00	METAL CHIP 1K 5%	1/10W
R030	1-216-049-00	METAL CHIP 1K 5%	1/10W
R031	1-216-055-00	METAL CHIP 1.8K 5%	1/10W
R035	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R040	1-216-121-00	METAL CHIP 1M 5%	1/10W
R041	1-216-046-00	METAL CHIP 750 5%	1/10W
R042	1-216-043-00	METAL CHIP 560 5%	1/10W
R043	1-216-043-00	METAL CHIP 560 5%	1/10W
R044	1-216-075-00	METAL CHIP 12K 5%	1/10W
R045	1-216-058-00	METAL GLAZE 2.4K 5%	1/10W
R046	1-216-045-00	METAL CHIP 680 5%	1/10W
R047	1-216-059-00	METAL CHIP 2.7K 5%	1/10W
R048	1-216-063-00	METAL CHIP 3.9K 5%	1/10W
R049	1-216-063-00	METAL CHIP 3.9K 5%	1/10W
R051	1-216-036-00	METAL CHIP 300 5%	1/10W
R052	1-216-052-00	METAL CHIP 1.3K 5%	1/10W
R053	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R055	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R056	1-216-077-00	METAL CHIP 15K 5%	1/10W
R057	1-216-049-00	METAL CHIP 1K 5%	1/10W
R058	1-216-049-00	METAL CHIP 1K 5%	1/10W
R059	1-216-037-00	METAL CHIP 330 5%	1/10W
R060	1-216-043-00	METAL CHIP 560 5%	1/10W
R061	1-216-073-00	METAL CHIP 10K 5%	1/10W
R062	1-216-081-00	METAL CHIP 22K 5%	1/10W
R065	1-216-073-00	METAL CHIP 10K 5%	1/10W
R067	1-216-295-00	METAL CHIP 0 5%	1/10W
R069	1-216-047-00	METAL CHIP 820 5%	1/10W
R071	1-216-058-00	METAL GLAZE 2.4K 5%	1/10W
R072	1-216-072-00	METAL CHIP 9.1K 5%	1/10W
R075	1-216-081-00	METAL CHIP 22K 5%	1/10W
R077	1-216-085-00	METAL CHIP 33K 5%	1/10W
R078	1-216-081-00	METAL CHIP 22K 5%	1/10W
R079	1-216-073-00	METAL CHIP 10K 5%	1/10W
R080	1-216-049-00	METAL CHIP 1K 5%	1/10W
R082	1-216-055-00	METAL CHIP 1.8K 5%	1/10W
R083	1-216-083-00	METAL CHIP 27K 5%	1/10W
R084	1-216-089-00	METAL CHIP 47K 5%	1/10W
R085	1-216-045-00	METAL CHIP 680 5%	1/10W
R086	1-216-066-00	METAL CHIP 5.1K 5%	1/10W
R087	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R088	1-216-066-00	METAL CHIP 5.1K 5%	1/10W
R089	1-216-117-00	METAL CHIP 680K 5%	1/10W
R091	1-216-295-00	METAL CHIP 0 5%	1/10W
R092	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R093	1-216-047-00	METAL CHIP 820 5%	1/10W
R094	1-216-073-00	METAL CHIP 10K 5%	1/10W
R099	1-216-059-00	METAL CHIP 2.7K 5%	1/10W
R102	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R111	1-216-109-00	METAL CHIP 330K 5%	1/10W
R113	1-216-295-00	METAL CHIP 0 5%	1/10W

Ref. No.	Part No.	Description	Remark
R115	1-216-129-00	METAL CHIP 2.2M 5% 1/10W	
R119	1-216-066-00	METAL CHIP 5.1K 5% 1/10W	
R801	1-216-023-00	METAL CHIP 82 5% 1/10W	
R802	1-216-037-00	METAL CHIP 330 5% 1/10W	
R805	1-211-954-11	METAL GLAZE 12 0.50% 1/10W	
R805	1-216-605-11	METAL CHIP 12 1% 1/10W	
R806	1-216-023-00	METAL CHIP 82 5% 1/10W	
R807	1-216-023-00	METAL CHIP 82 5% 1/10W	
R811	1-216-037-00	METAL CHIP 330 5% 1/10W	
R812	1-216-023-00	METAL CHIP 82 5% 1/10W	
R815	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R816	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R817	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R835	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R836	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R838	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R840	1-208-758-11	METAL GLAZE 100 0.50% 1/10W	
R840	1-216-627-11	METAL CHIP 100 0.5% 1/10W	
R841	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R842	1-208-750-11	METAL GLAZE 47 0.50% 1/10W	
R842	1-216-619-11	METAL CHIP 47 0.5% 1/10W	
R843	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R844	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R846	1-216-059-00	METAL CHIP 2.7K 5% 1/10W	
R847	1-216-078-00	METAL GLAZE 16K 5% 1/10W	
R848	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R849	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R850	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R851	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R852	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R853	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R856	1-216-033-00	METAL CHIP 220 5% 1/10W	
R857	1-216-033-00	METAL CHIP 220 5% 1/10W	
R858	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R859	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R860	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R861	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R862	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R863	1-216-047-00	METAL CHIP 820 5% 1/10W	
R901	1-216-039-00	METAL CHIP 390 5% 1/10W	
R902	1-216-033-00	METAL CHIP 220 5% 1/10W	
R903	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R904	1-216-295-00	METAL CHIP 0 5% 1/10W	
R906	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R907	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R908	1-216-033-00	METAL CHIP 220 5% 1/10W	
R910	1-216-025-00	METAL CHIP 100 5% 1/10W	
R913	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R914	1-216-077-00	METAL CHIP 15K 5% 1/10W	

Ref. No.	Part No.	Description	Remark
R915	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R916	1-216-039-00	METAL CHIP 390 5% 1/10W	
R917	1-216-045-00	METAL CHIP 680 5% 1/10W	
R918	1-216-043-00	METAL CHIP 560 5% 1/10W	
R919	1-216-039-00	METAL CHIP 390 5% 1/10W	
R920	1-216-043-00	METAL CHIP 560 5% 1/10W	
R921	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R922	1-216-047-00	METAL CHIP 820 5% 1/10W	
R924	1-216-035-00	METAL CHIP 270 5% 1/10W	
R925	1-216-045-00	METAL CHIP 680 5% 1/10W	
R926	1-216-025-00	METAL CHIP 100 5% 1/10W	
R927	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R928	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R929	1-216-043-00	METAL CHIP 560 5% 1/10W	
R931	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R933	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R947	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R966	1-216-295-00	METAL CHIP 0 5% 1/10W	

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remark
RV001	1-238-856-11	RES, ADJ, CERMET 10K	
RV003	1-238-856-11	RES, ADJ, CERMET 10K	
RV004	1-238-856-11	RES, ADJ, CERMET 10K	
RV005	1-238-856-11	RES, ADJ, CERMET 10K	
RV006	1-238-857-11	RES, ADJ, CERMET 22K	
RV009	1-238-854-11	RES, ADJ, CERMET 2.2K	

< TRANSFORMER >

Ref. No.	Part No.	Description	Remark
T001	1-403-617-11	COIL, TANK	

< VIBRATOR >

Ref. No.	Part No.	Description	Remark
X001	1-760-118-21	VIBRATOR, CRYSTAL (4.43MHz)	

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MISCELLANEOUS

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Ref. No.	Part No.	Description	Remark
3	1-467-489-41	SWITCH BLOCK, CONTROL (E40UX)	
3	1-467-489-61	SWITCH BLOCK, CONTROL (E40ES/E40IT)	
58	1-751-794-21	CABLE, FFC (FMD-5)	
808	3-946-973-01	HEAD (HV113001), FE	
⚠818	8-848-540-01	UPPER DRUM ASSY (DZR-21-R)	
839	3-947-082-01	HEAD (HVMZA1136), ACE	
856	3-946-948-01	JOINER (MCN40011), PWB	
922	3-947-029-01	LEAD ASSY, CM	
⚠M901	8-848-597-11	DRUM ASSY (DZH-48A-R)	
⚠M902	3-947-028-01	MOTOR (F2QKB38) (CAPSTAN)	
M903	3-946-917-01	MOTOR ASSY, L (LOADING)	

The components identified by
mark ⚠ or dotted line with mark
⚠ are critical for safety.
Replace only with part number
specified.

Ref. No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS	
		********************************	
⚠	1-575-131-11	CORD, POWER SUPPLY (E40ES/E40IT)	
⚠	1-590-866-21	CORD, POWER (E40UX)	
	1-696-593-11	CORD, CONNECTION (PAL) (AERIAL)	
	3-758-273-11	MANUAL, INSTRUCTION (ENGLISH) (E40UX)	
	3-758-273-41	MANUAL, INSTRUCTION (SPANISH) (E40ES)	
	3-758-273-51	MANUAL, INSTRUCTION (ITALIAN) (E40IT)	
*	3-957-412-01	CUSHION (UPPER)	
*	3-957-413-01	CUSHION (LOWER)	
*	3-958-366-01	INDIVIDUAL CARTON (E40UX)	
*	3-958-366-11	INDIVIDUAL CARTON (E40ES/E40IT)	

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HARDWARE LIST

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#1	7-624-106-04	STOP RING 3.0, TYPE -E
#2	7-685-782-01	SCREW +PTT 2X5 (S)
#3	7-685-648-79	SCREW +BVTP 3X12 TYPE2 IT-3
#21	7-621-773-86	SCREW +PTT 2.6X4 (S)
#22	7-621-770-87	SCREW +PTT 2.6X5 (S)
#23	7-682-547-04	SCREW +PTT 3X6 (S)

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

SECTION 6

INTERFACE, IC PIN FUNCTION DESCRIPTION

6-1. SYSTEM CONTROL – MECHANISM BLOCK INTERFACE (MA-200 BOARD IC501)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOAD-ING	TAPE THREAD-ING	TAPE UNTHREAD-ING	STOP	FF	REW	PB	PB-PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC-PAUSE
CAM M	MA-200 Board IC501 (91)	O	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L
CAMP	MA-200 Board IC501 (92)	O	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L
MODE 1	MA-200 Board IC501 (58)	I	L	L	L	H	H	H	H	H	H	H	H	H	H	H	H	H
MODE 2	MA-200 Board IC501 (57)	I	L	H	L	L	H	L	L	L	L	H	H	L	L	L	L	H
MODE 3	MA-200 Board IC501 (56)	I	H	H	H	L	H	H	H	H	L	L	L	L	L	L	L	L
MODE 4	MA-200 Board IC501 (55)	I	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
C-OUT	MA-200 Board IC501 ㉚	I	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
C-START	MA-200 Board IC501 ㉙	I	H	L	L	H	H	H	H	H	H	H	H	H	H	H	H	H
C-IN	MA-200 Board IC501 ㉘	I	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L
REC SAF	MA-200 Board IC501 (78)	I	L	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
T REEL FG	MA-200 Board IC501 ⑯	I	H/L	H/L	H/L	H/L	H/L	H/L	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
S REEL FG	MA-200 Board IC501 ⑮	I	H/L	H/L	H/L	*2	*2	H/L	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
END LED	MA-200 Board IC501 ㊲	O	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
CAP TRQ1	MA-200 Board IC501 ㉟	O	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
CAP TRQ2	MA-200 Board IC501 ㊱	O	H	H	H	H	H	H	H	H	H	H	*4	H	H	H	H	H
CAP STOP	MA-200 Board IC501 ㉞	O	L	*5	*5	*5	*5	L	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
T SENS	MA-200 Board IC501 (63)	I	*3	*3	*3	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
S SENS	MA-200 Board IC501 (64)	I	*3	*3	*3	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6

*1. "L" when erasing protection tab is bent. "H" when not bent.
*2. Pulse of period in proportion to reel rotating speed.
*3. Approx. 2 msec period "H" pulse.
*4. pulse.
*5. 3 value output of "H", "L" and "Hi-Z (2.5 V)".
*6. Nomally "L". 2 msec period "H" pulse when tape top or tape end is detected.

6-2. SYSTEM CONTROL – SERVO PERIPHERAL CIRCUIT INTERFACE (MA-200 BOARD IC501)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREAD-ING	TAPE UNTHREAD-ING	PB	PB• PAUSE	SLOW	×2	CUE	REVIEW	REC	REC• PAUSE
REC CTL	MA-200 IC501 ⑦	O	*14	*14	*14	*14	*14	*14	*14	*14	*14	*14	*14	*1	*14
STEP PLS	MA-200 IC501 ⑭	O	L	*2	*2	*2	*2	*2	L	*3	*2	*2	*2	*2	L
SW POSITION *4	MA-200 IC501 (62)	I													
$\overline{\text{PB CTL}}$	MA-200 IC501 (67)	I	H	*5	*5			*1	H/L	*3	*5	*5	*5	*1	H
DRUM PG	MA-200 IC501 (68)	I	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
DRUM FG	MA-200 IC501 (69)	I	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
CAP FG	MA-200 IC501 (70)	I	H/L	*8	*8	*9	*9	*8	H/L	*10	*8	*8	*8	*8	H/L
CAP RVS	MA-200 IC501 (72)	O	H/L	L	H	L	H	L	L	*3	L	L	H	L	*L
CAP DA *14	MA-200 IC501 (73)	O	*11	*11	*11	*11	*11	*12	*11	*11	*12	*12	*12	*12	*11
DRUM DA *4	MA-200 IC501 (74)	O	*13	*13	*13	*13	*13	*13	*13	*13	*13	*13	*13	*13	*13
CTL STEP	MA-200 IC501 (75)	O	L	L	L	L	L	L	L	*15	L	L	L	L	L

*1. 25 Hz or 30 Hz pulse.
*2. 25 Hz or 30 Hz value output of "H", "L" and Hi-Z (2.5 V).
*3. 25 Hz or 30 Hz Unstable period Pulse.
*4. 25 Hz or 30 Hz Input terminal for video switching position adjustment.
*5. 25 Hz or 30 Hz Pulse of period in propotion to tape speed.
*6. 25 Hz or 30 Hz 30 Hz "H" pulse.
*7. 600 Hz or 720 Hz pulse.
*8. Pulse of period in proportion to tape speed.
*9. Unstable period pulse
*10. Pulse at tape running.
*11. Approx. 2 msec period "H" or "L" pulse.
*12. Approx. 1.5 msec period "H" or "L" pulse.
*13. Approx. 3 msec period "H" or "L" pulse.
*14. Hi-Z (2.5 V).
*15. "H" when FWD diedirection STEP drive.

6-3. SYSTEM CONTROL – SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-200 BOARD IC501)

Signal	Pin No.	I/O	I/O level
$\overline{\text{COSMO•RESET}}$	MA-200 Board IC501 ㊵	I	Normally "H". "L" when service interruption is detected or restored.
$\overline{\text{COSMO•CS}}$	MA-200 Board IC501 ㊹	I	Always "H".
SI•BUS	MA-200 Board IC501 ㊺	I	Serial communication data from timer microprocessor. V period "L" pulse.
SO•BUS	MA-200 Board IC501 ㊻	O	Serial communication data to timer microprocessor. V period "L" pulse.
$\overline{\text{S CLK}}$	MA-200 Board IC501 ㊼	I	Serial communication clock with timer microprocessor. V period "L" pulse.

6-4. SYSTEM CONTROL AND RF MODULATOR – INPUT SELECTION BLOCK INTERFACE (MA-200 BOARD IC501)

Signal	Pin No.	I/O	I/O level
LINE 1	MA-200 Board IC501 ⑱	O	Input select control signal.

6-5. SYSTEM CONTROL – VIDEO BLOCK INTERFACE (MA-200 BOARD IC501)

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE LOADING	TAPE UNLOAD-ING	PB	PB• PAUSE	SLOW	×2	CUE	REVIEW	REC	REC• PAUSE
$\overline{\text{V-PB}}$	MA-200 Board IC501 (91)	O	H	H	H	L	L	L	L	L	L	H	H
HEAD CONT	MA-200 Board IC501 ⑰	O	L	L	L	L	H	*1	H	L	L	H	L
RF SWP.	MA-200 Board IC501 ①	O	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
Q VD	MA-200 Board IC501 ②	O	L	L	L	*3	*4	*4	*4	*4	*4	L	L
$\overline{\text{SP}}$	MA-200 Board IC501 ⑩	O	*5	*5	*5	*6	*6	*6	*6	*6	*6	*5	*5
REC. P	MA-200 Board IC501 ⑤	O	L	L	L	L	L	L	L	L	L	L	H
REC	MA-200 Board IC501 ⑥	O	L	L	L	L	L	L	L	L	L	H	H
V SYNC	MA-200 Board IC501 (66)	I	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7

*1. "H" when tape stops. "L" when tape runs (approx. for 33 msec).
*2. Syncronized with drum rotation. 25 Hz or 30 Hz 50% duty pulse.
*3. Normally "L". "H" when video signal is not generated.
*4. V period "H" pulse.
*5. Selected by SP/EP. SP mode: "L", EP mode: "H".
*6. Selected by tape recording mode.

sig/mod	SP	LP	EP
SP (10)	L	H	H
LP (11)	L	H	L
EP (12)	L	L	H

*7. Composite sync signal (positive).
*8. "H" when menu screen or blue back screen.

6-6. SYSTEM CONTROL – AUDIO BLOCK INTERFACE (MA-200 BOARD IC501)

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE LOADING	TAPE UNLOAD-ING	PB	PB• PAUSE	SLOW	×2	CUE	REVIEW	REC	REC• PAUSE
NA PB	MA-200 Board IC501 (94)	O	L	L	L	H	H	H	H	H	H	L	L
A MUTE	MA-200 Board IC501 (95)	O	L	L	L	L	H	H	H	H	H	L	L
NA REC P	MA-200 Board IC501 ⑬	O	L	L	L	L	L	L	L	L	L	H	L
$\overline{\text{SP}}$	MA-200 Board IC501 ⑩	O	*1	*1	*1	*2	*2	*2	*2	*2	*2	*1	*1

*1. Selected by SP/EP selector. SP mode: "L", EP mode: "H".
*2. Selected by tape recording mode. SP mode: "L", EP mode: "H".

6-7. SERVO/SYSTEM CONTROL MICROPROCESSOR PIN FUNCTION
(MA-200 BOARD IC501)

Pin. No.	Port	I/O	Name	Function
1	PB5/PPO13	O	RF SWP	Video switching pulse output
2	PB4/PPO12	O	Q VD	Quasi VD pulse output
3	PB3/PPO11	O	Q HD ENABLE	Quasi HD control
4	PB2	O	AF REC $\overline{\text{P}}$	Not used
5	PB1	O	REC • $\overline{\text{P}}$	"H" output when video REC (REC control)
6	PB0	O	REC	"H" output when REC
7	PC7	O	REC CTL	REC CTL output
8	PC6	I	$\overline{\text{STEREO}}$	Not used
9	PC5	O	NC	Not used
10	PC4	O	$\overline{\text{SP}}$	"L" when SP mode
11	PC3	I	$\overline{\text{POWER FAIL}}$	"L" when AC OFF
12	PC2	O	EP/LP/$\overline{\text{SP}}$	Not used
13	PC1	O	NA REC $\overline{\text{P}}$	"H" output when Audio REC
14	PC0	O	STEP PLS	"H" when capstan STEP is driven
15	PJ7	I	S REEL FG	S reel sensor input
16	PJ6	I	T REEL FG	T reel sensor input
17	PJ5	O	HEAD CONT	Head amp IC control
18	PJ4	O	LINE 1	"H" when LINE output
19	PJ3	I	3.58 MHz	"H" when 3.58 mode
20	PJ2	I	RENTAL	"H" when NOISE REDUCTION Not used
21	PJ1	O	SECAM	"H" when SECAM mode
22	PJ0	I	ME SECAM	"H" when ME SECAN mode Not used
23	PD7	I	MAIN/$\overline{\text{SAP}}$	Not used
24	PD6	I	TU CLOCK	Tuner control signal
25	PD5	I	TU PATA	
26	PD4	I	TU ENABLE	
27	PD3	O	NT JUDGE	Not used
28	PD2	I	C-IN	Cassette switch input
29	PD1	I	C-START	
30	PD0	I	C-OUT	
31	PH7	O	SYS CHECK	SYSTEM CHECK signal output Not used
32	PH6	O	SYS RESET	SYSTEM RESET signal
33	PH5	O	$\overline{\text{EEPR CS}}$	EEPROM control signal
34	PH4	O	CAP STOP	"L" when capstan stopped
35	PH3	O	CAP TRQ 1	Current drive capstan motor control
36	PH2	O	CAP TRQ 2	
37	PH1	O	END LED	End sensor lamp drive output
38	PH0	O	OSD ENABLE	OSD control signal output
39	MP	I	MP	Fixed "L" level
40	$\overline{\text{RST}}$	I	$\overline{\text{COSMO RESET}}$	System reset input

Pin. No.	Port	I/O	Name	Function
41	V_{SS}		V_{SS}	GND
42	XTAL	O	XTAL	System clock 12 MHz
43	EXTAL	I	EXTAL	
44	$\overline{\text{CS0}}$	O	$\overline{\text{COSMO CS}}$	Fixed "L" level
45	SI0	I	SI BUS	Signal for serial communication
46	SO0	O	SO BUS	Signal for serial communication
47	$\overline{\text{SCK0}}$	O	$\overline{\text{S CLK}}$	Clock for serial communication
48	PF7/AN11	I	$\overline{\text{NTSC}}$	"L" when video system NTSC mode
49	PF6/AN10	I	AFT	AFT signal input
50	PF5/AN9	I	LP JOG	"H" when LP JOG mode
51	PF4/AN8	O	AF SW POSI	VR input for AF SWP adjustment Not used
52	AV_{SS}		AV_{SS}	UNSW GND
53	AV_{REF}		AF_{REF}	AD port reference input UNSW 5V
54	AV_{DD}		AV_{DD}	UNSW 5V
55	PF3/AN7	I	MODE 4	Mechanism section CAM encoder input
56	PF2/AN6	I	MODE 3	
57	PF1/AN5	I	MODE 2	
58	PF0/AN4	I	MODE 1	
59	AN3	I	DEST/DEW	Descrimination DC input
60	AN2	I	RF ENV	Video RF envelope input
61	AN1	I	AF ENV	HiFi audio RF envelope Not used
62	AN0	I	RF SW POSI	VR input for RF SWP adjustment
63	PG7	I	T SENS	Take-up side end sensor input
64	PG6	I	S SENS	Supply side end sensor input
65	PG5	I	$\overline{\text{H DET}}$	H sync-descrimination input
66	PG4/SYNC	I	V SYNC	Composite sync input
67	PG3/$\overline{\text{PBCTL}}$	I	$\overline{\text{PB CTL}}$	Playback CTL input
68	PG2/DPG	I	DRM PG	Drum PG input
69	PG1/DFG	I	DRM FG	Drum FG input
70	PG0/CFG	I	CAP FG	Capstan FG input
71	PE7	O	$\overline{\text{JOG}}$	"L" when JOG mode
72	PE6	O	CAP RVS	Capstan reverse signal output
73	PE5	O	CAP DA	Capstan error D/A output
74	PE4	O	DRUM DA	Drum error D/A output
75	PE3	O	CTL REC	"H" when CTL writing
76	PE2	O	CTL STEP	CTL amp step action control
77	PE1	O	R/B	EEPROM control output
78	PE0		REC SAF	Erasing protection tab detection
79	SI1	O	AUTO PRESET	"H" during auto preset. Not used
80	SO1	O	EXP SO	Not used

Pin. No.	Port	I/O	Name	Function
81	SCKI		EXP CLK	Not used
82	PI4	O	E TAPE	"L" when high RF level tape PB
83	PI3	O	F MONO	"L" when monoral mode. Not used
84	PI2/PWM	O	ANT TV	Not used
85	PI1/RMC	I	RMC	SIRCS signal output
86	TEX	I	TEX	
87	TX		TX	
88	Vss		Vss	GND
89	VDD		VDD	UNSW 5V
90	N.C.			UNSW 5V
91	PA7	O	CAM M	Loading motor control
92	PA6	O	CAM P	
93	PA5	O	POWER ON	"H" when during power on
94	PA4	O	NA PB	"H" when audio playback
95	PA3	O	A MUTE	Audio muting output "H" : muting
96	PA2	O	V-PB	"L" when video playback
97	PA1	O	SYS RESET	System reset signal
98	PA0	O	LCD CS	LCD drive micon control signal
99	PB7	O	TV/VTR	Not used
100	PB6/PPO14	O	AF SWP	HiFi audio switching pulse signal. Not used

6-8. LCD DRIVER PIN FUNCTION (HI-2/3 BOARD IC001)

Pin No.	Pin Name	I/O	Function
1 – 20	SEG 12 – 31	O	LCD segment output
21 – 23	COM 0 – 2	O	LCD common output
24	N. C.	O	Not used
25	BIAS	O	Open. Not used
26 – 28	VLC 0 – 2	O	Open. Not used
29	REC	O	REC LED output
30	TIM REC	O	TIMER REC LED output
31, 32	N. C.	O	Not used
33	GND		Ground
34 – 37	KEYOUT 0 – 3	O	Key output
38	N. C.	I	Not used
39	S CLK	I	Serial clock input
40	SI	O	Serial communication output to system controller
41	SO	I	Serial communication input from system controller
42	N. C.	I	Not used
43	LCD CS	I	Chip select signal for LCD input
44, 45	N. C.	I	Not used
46	POWER LED	O	Power LED output
47	N. C.	O	Not used
48	N. C.	O	Not used
49	N. C.	O	Open. Not used
50	N. C.	O	Not used
51	B. LIGHT LED	O	Back light LED on/off output H: ON
52	N. C.	O	Not used
53	BACK LIGHT	O	Back light on/off output L: ON
54, 57	VDD		Power supply +5 V
55, 56	N. C.	I	Not used
58, 59	X1, 2	I	Main system clock input
60 – 67	KEYIN 0 – 7	I	Key input
68	RST	I	Reset input
69 – 80	SEG 0 – 11	O	LCD segment output

SECTION 7
ADJUSTMENTS

During the adjustment, see the Parts Arrangement Diagram for adjustments on Page 7-6.

7-1. MECHANICAL ADJUSTMENTS

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT Ⅲ.

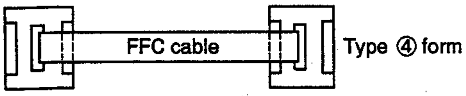
7-2. ELECTRICAL ADJUSTMENTS

2-1. PRE-ADJUSTMENT PREPARATIONS

Necessary items and indications for total adjustment of electric circuit of this machine will be described in this chapter.

2-1-1. Instruments to be Used

1) Color TV
2) Oscilloscope 1 or 2 phenomena, band more than 30 MHz, delay mode, as provided.
3) Frequency counter (min. 8 digits)
4) PAL pattern generator
5) Digital voltmeter
6) Audio level meter
7) Audio generator
8) Attenuator
9) Alignment tape
   Part Code: H7099052H (MH-2)
10) Extension cables (See page 7-2 for using location)


FFC cable
Type ④ form

① RV-33 (CN001) ↔ MA-200 (CN801)
(14 pins J-6090-044-A)

② RV-33 (CN002) ↔ MA-200 (CN802)
(20 pins J-6090-043-A)

2-1-2. Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

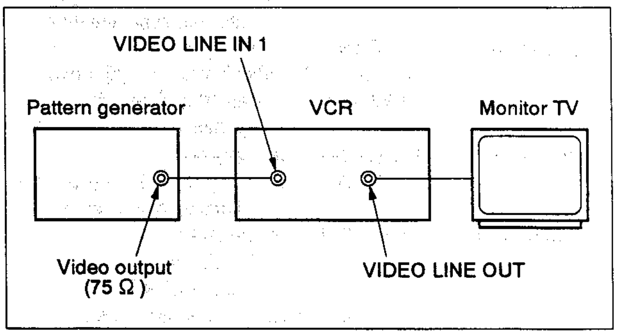

VIDEO LINE IN 1
Pattern generator
VCR
Monitor TV
Video output
(75 Ω)
VIDEO LINE OUT

Fig. 7-2-1.

2-1-3. Set-up Adjustment

In this adjustment, PAL pattern generator is connected with LINE 1 input signal terminal. When check to tuner, connected AERIAL terminal. Check that the amplitudes of video signal SYNC signal, of picture portions, and of burst signals are flat at approximately 0.3, 0.7 and 0.3 V, respectively, and that the level ratio of the burst sigal and "red" signal are 0.30 : 0.66. Fig. 7-2-2. shows video signals (color bars) used in adjusting the video section.

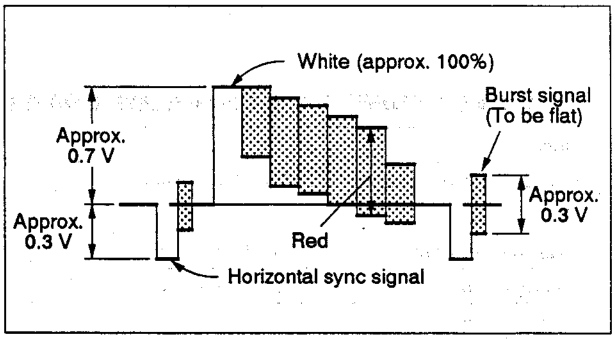

White (approx. 100%)
Burst signal
(To be flat)
Approx.
0.7 V
Approx.
0.3 V
Approx.
0.3 V
Red
Horizontal sync signal

Fig. 7-2-2.

2-1-4. Alignment Tape (MH-2)

	Time	Video signal	Audio signal
1	10 minutes	Stair-step	6 kHz
2	5 minutes	—	3 kHz
3	10 minutes	Color bar	1 kHz
4	3 minutes	RF sweep	—

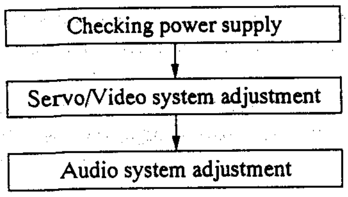
2-1-5. Specified I/O Level and Impedance

Input/output terminal

Video inputs LINE IN : phono jack
EURO-AV : 21-pin (Pin ⑳) 1 Vp-p, 75 Ω, unbalanced, sync negative
Audio inputs LINE IN : phono jacks
47 kΩ, − 7.5 dBs (0 dBs = 0.775 Vrms)
EURO-AV : 21-Pin (Pin ② and ⑥)
More than 10 kΩ, − 4 dBs
Video outputs LINE OUT : phono jack
EURO-AV : 21-pin (Pin ⑲) 1 Vp-p, 75 Ω, unbalanced, sync negative
Audio outputs LINE OUT : phono jacks
− 7.5 dBs at load impedance 47 kΩ
Output impedance : less than 10 kΩ
EURO-AV : 21-Pin (Pin ① and ③)
Output impedance : less than 1 kΩ
−4 dBs with 10 kΩ load

2-1-6. Adjusting Sequence

Make the electrical adjustment in the following sequence.


Checking power supply
Servo/Video system adjustment
Audio system adjustment

2-2. POWER SUPPLY CHECK (MA-200 BOARD)

Mode	E-E
Measuring Instrument	Digital voltmater
SW 12 V check	
Measurement Point	Pin ② of IC121
Specified Value	12.0 ± 0.3 Vdc
MTR 12 V check	
Measurement Point	Cathode of D121
Specified Value	12.4 ± 0.5 Vdc
SW 5 V check	
Measurement Point	Emitter of Q123
Specified Value	5.0 ± 0.2 Vdc
D5 V check	
Measurement Point	Cathode of D502
Specified Value	5.1 ± 0.2 V
DC 40 V check	
Measurement Point	C187 ⊕ side
Specified Value	44.0 ± 1.5 V Vdc

Checking Method:

1) Confirm that each voltage meets its specified value.

2-3. SERVO/VIDEO SYSTEM ADJUSTMENTS

- **NOTE ON REPAIRING RV-33 BOARD**

[Servicing Jig]
MA-200 ↔ RV-33 Extension cable.
ⓐ 14 pins (J-6090-046-A) CN801 ↔ CN001
ⓑ 20 pins (J-6090-045-A) CN802 ↔ CN002

① There are two types of the connectors between MA-200 and RV-33 boards according to the manufacturing companies (TAIKO or MOLEX). They are not interchangeable.
② Servicing jigs are for common use.
When using it, please be sure to confirm the form of connectors.

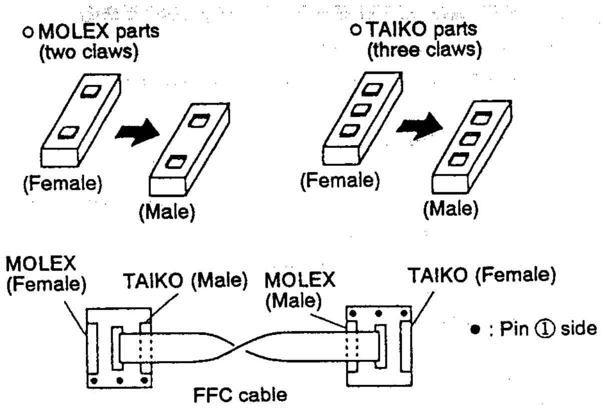

o MOLEX parts
(two claws)
o TAIKO parts
(three claws)
(Female)
(Male)
(Female)
(Male)
MOLEX
(Female)
TAIKO (Male)
MOLEX
(Male)
TAIKO (Female)
● : Pin ① side
FFC cable

Fig. 7-2-3

- EXTENSION CABLE USING LOCATION
(See page 7-1 for details of extension cables.)

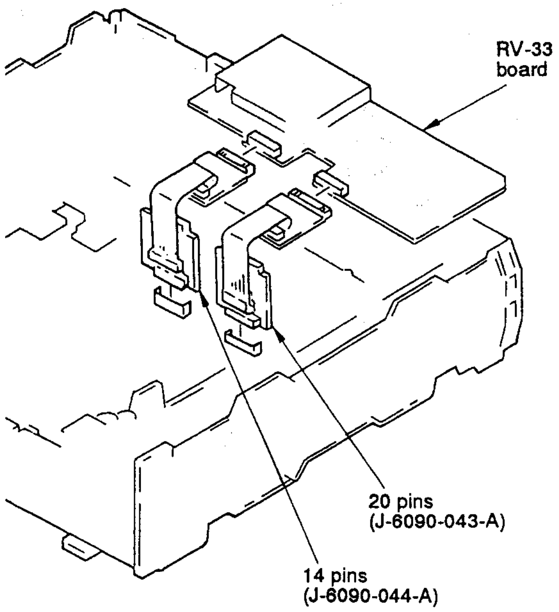

RV-33
board
20 pins
(J-6090-043-A)
14 pins
(J-6090-044-A)

Fig. 7-2-4.

2-3-1. Switching Position Adjustment (MA-200 Board)

Purpose:

Adjust the interval between A ch and B ch of tape playback output.

Improve the interchangeability with other tapes and sets.

When it is out of order, the interval appears on the screen, the screen is disturbed.

Mode	PB
Signal	Alignment tape
Measurement Point	CH1: CNJ001 VIDEO LINE OUT CH2: Pin ③ of CN802 (RV-33 board) (RF SWP)
Measuring Instrument	Oscilloscope
Adjusting Element	RV502
Specified Value	6.5 ± 0.5 H (416 ± 32 μsec)

Adjusting Method:

1) Adjust the tracking position to the center by pushing tracking buttons ▲, ▼ (on remote commander).
2) Check that switching position is 6.5 ± 0.5 H. (416 ± 32 μsec)
   If not meet the specified value, turn RV502 and repeat steps 1) to 2).

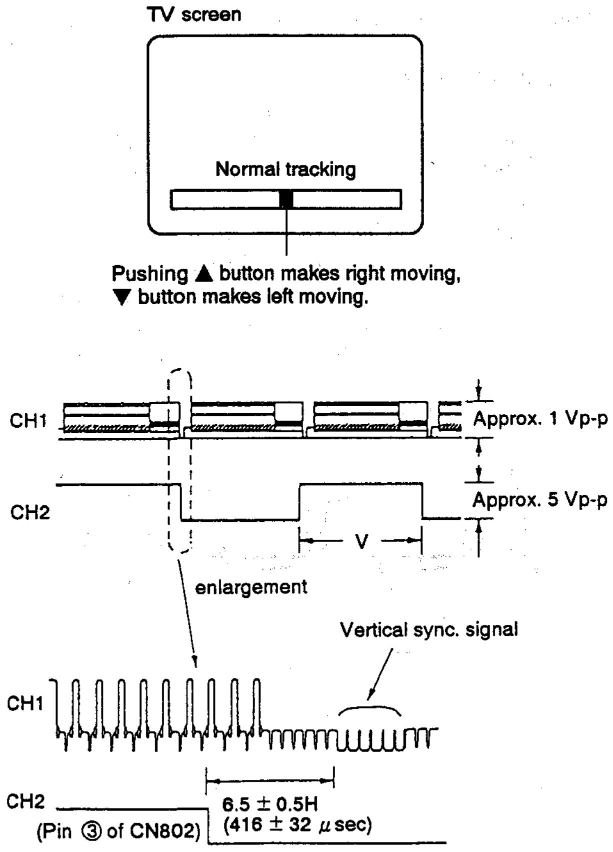

TV screen
Normal tracking
Pushing ▲ button makes right moving,
▼ button makes left moving.
CH1
Approx. 1 Vp-p
CH2
Approx. 5 Vp-p
V
enlargement
Vertical sync. signal
CH1
CH2
(Pin ③ of CN802)
6.5 ± 0.5H
(416 ± 32 μsec)

Fig. 7-2-5.

2-3-2. Sync AGC Adjustment (RV-33 Board)

Mode	E-E
Signal	Color bar
Measurement Point	CNJ001 VIDEO LINE OUT (MA-200 board)
Measuring Instrument	Oscilloscope
Adjusting Element	RV001
Specified Value	1.00 ± 0.05 Vp-p

Note : VIDEO LINE OUT terminal must be terminates at 75Ω.

Adjusting Method:

1) With RV001, adjust the VIDEO signal level to 1.00 ± 0.05 Vp-p

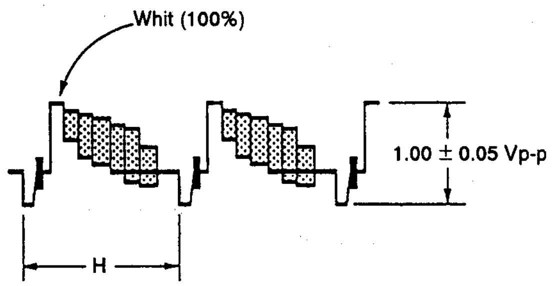

Whit (100%)
1.00 ± 0.05 Vp-p
H

Fig. 7-2-6

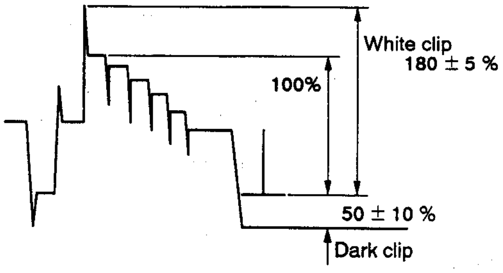
2-3-3. White Clip Adjustment (RV-33 Board)

Purpose:

Adjust the frequency of FM modulated YFM signal doesn't go too high.

When it is out of order, white goes flat and black is over-modulated.

Signal	Color bar
Measurement Point	Pin ㊺ of IC001
Measuring Instrument	Oscilloscope
Adjusting Element	RV004
Specified Value	White clip : 180 ± 5% Dark clip : 50 ± 10%


White clip
180 ± 5 %
100%
50 ± 10 %
Dark clip

Fig, 7-2-7

2-3-4. Recording Chroma Adjustment (RV-33 Board)

Purpose:

Adjust recording chroma level.

When it is out of order, S/N ratio of color goes bad, the picture is not colored and second sequence beat appears.

Mode	E-E
Signal	Color bar
Measurement Point	Q013 Emitter
Measuring Instrument	Oscilloscope
Adjusting Element	RV009
Specified Value	120 ± 10 mVp-p

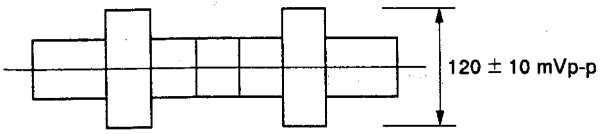


Fig. 7-2-8

Reference:

Adjusting level is low; Bad color S/N ratio, not colored.

Adjusting level is high; Second sequence beat (squared noise) appears.

2-3-5. Playback Level Adjustment (RV-33 Board)

Purpose:

Adjust playback video signal level to the specification.

When it is out of order, the picture is darkened or brightened on TV screen. White goes flat.

Mode	Playback
Signal	Color bar or alignment tape
Measurement Point	VIDEO LINE OUT
Measuring Instrument	Oscilloscope
Adjusting Element	RV003
Specified Value	1.0 ± 0.02 Vp-p

Note : Video Output terminal must be terminated at 75Ω.

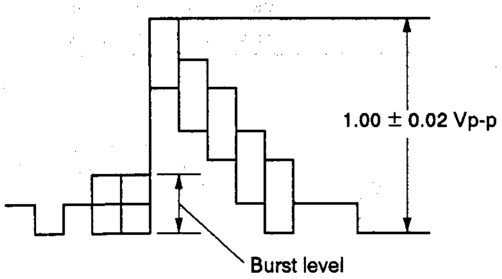


Fig. 7-2-9

Reference:

Adjusting level is low; The picture is darkened on TV screen.

Adjusting level is high; The picture is brightened on TV screen. White goes flat.

2-3-6. Carrier Deviation Adjustment (RV-33 Board)

Purpose:

Adjust FM modulating frequency for signal.

When it is out of order, black and white are over-modulated, interchangeability is lack, the screen is darkened or brightened or off.

This adjustment should be done after checking 2-3-5. Playback Level Adjustment is satisfied.

Carrier Set	
Mode	E-E
Signal	None
Measurement Point	Emitter of Q034
Measuring Instrument	Frequency Counter
Adjusting Element	RV006
Specifed Value	3.80 ± 0.05 MHz
Deviation	
Mode	REC. PB
Signal	Color bar
Measurement Point	VIDEO LINE OUT
Measuring Instrument	Oscillosope
Adjusting Element	RV005
Specifed Value	1.00 ± 0.02Vp-p

Note : Video Output terminal must be terminated at 75Ω.

Adjusting Method:

1) Set to E-E mode in the no signal condition.
2) Connect frequency counter to emitter of Q034, and adjust with RV006 so that the reading on frequwncy counter goes 3.80 ± 0.05 MHz.
3) Feed the color bar signal and record it.
4) Playback the recorded signal and sheck the signal at VIDEO LINE OUT goes 1.00 ± 0.02 Vp-p with oscilloscope.
5) When it is out of order, adjustment it with RV005.
6) Repeat items 4) and 5) fill the specification is satisfied.

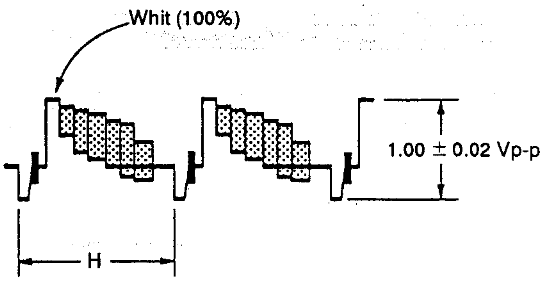


Fig. 7-2-10

2-3-7. VCO Adjustment (RV-33 Board)

Purpose:

Adjust to lock the color surely.

When it is out of order, the picture doesn't colored.

Mode	PB
Signal	Color bar
Measurement Point	Pin (55) of IC001
Measuring Instrument	Digital voltmeter
Adjusting Element	T001
Specified Value	2.5 ± 0.1 Vdc

2-3-8. VCO Frequency Adjustment (MA-200 Board)

Purpose:

Adjust to set the character position on the screen.

Mode	E-E
Signal	Color bar
Measurement Point	Pin ㉖ of IC601
Measuring Instrument	Oscilloscope (DC mode)
Adjusting Element	CT601
Specified Value	+2.45 ± 0.05 V

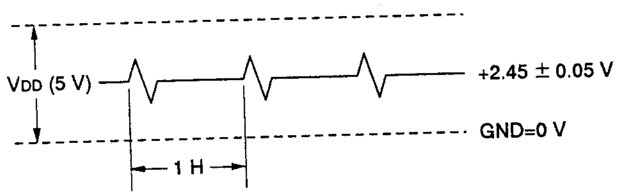


Fig. 7-2-11.

2-4. AUDIO SYSTEM ADJUSTMENTS

[Connection]

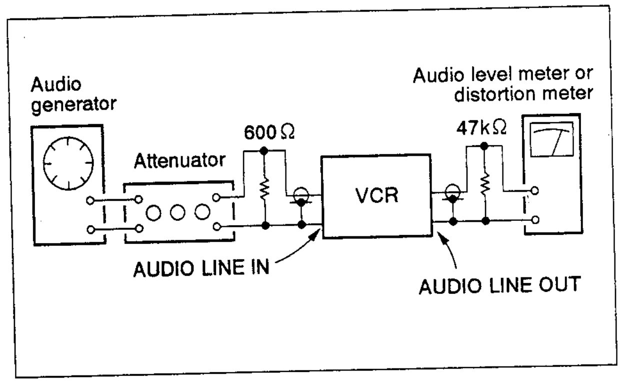

Audio generator
Audio level meter or distortion meter
600Ω
47kΩ
Attenuator
VCR
AUDIO LINE IN
AUDIO LINE OUT

Fig. 7-2-12.

2-4-1. Normal Audio System Adjustment

- Make adjustment in the SP mode, unless otherwise specified. Use a normal VHS cassette for an adjustment tape.
- Set AUDIO MONITOR to normal.

1. ACE Head Adjustment

Refer to the service manual of VHS MECHANICAL ADJUSTMENT Ⅲ.

2. Recording Bias Adjustment (MA-200 Board)

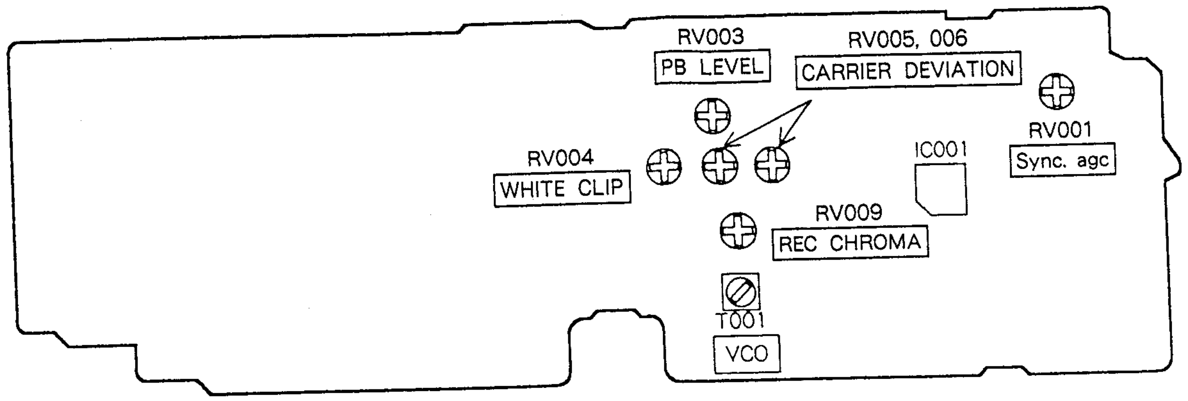
Mode	REC and PB
Signal	400 Hz, − 27.5 dBs 7 kHz, − 27.5 dBs
Measurement Point	AUDIO LINE OUT L or R
Measuring Instrument	Audio level meter
Adjusting Element	RV301
Specified Value	0 ± 1 dB

Adjusting Method:

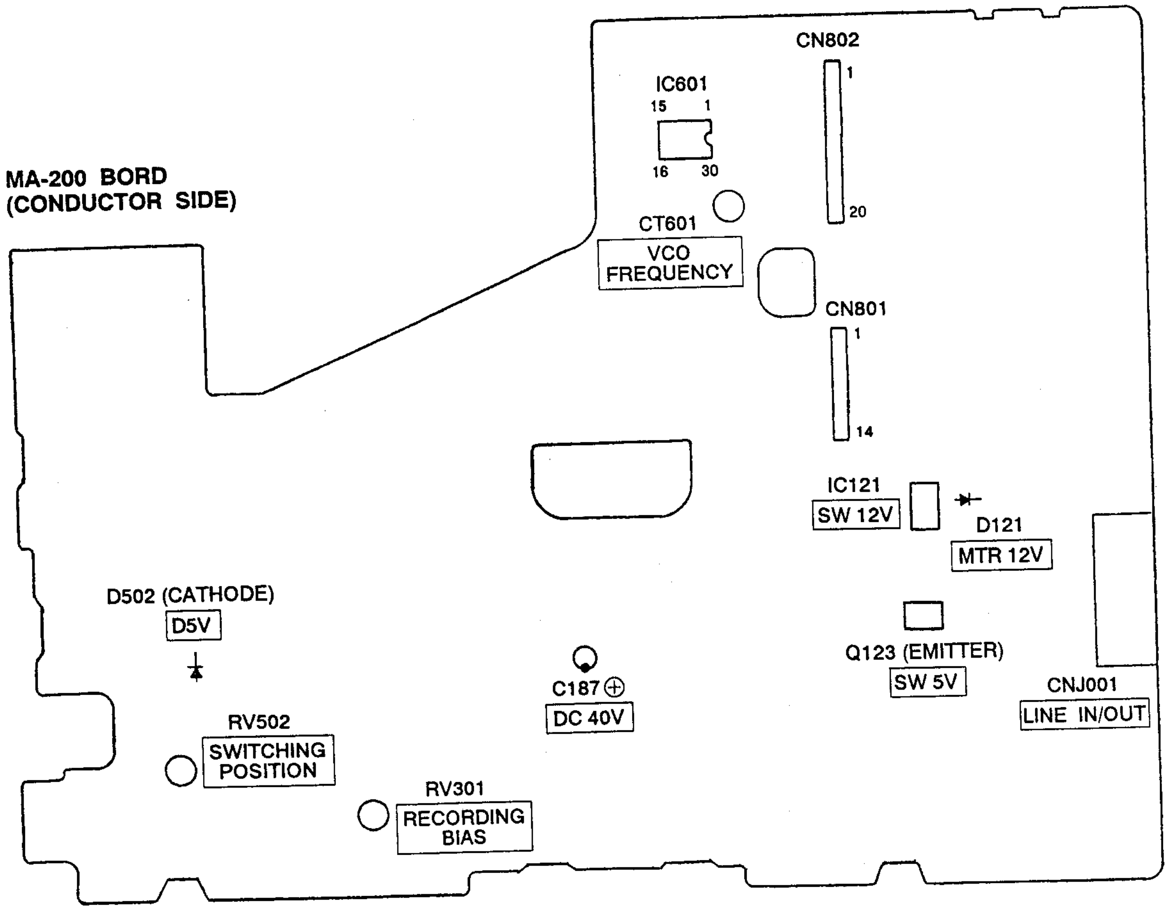
1) Supply a signal of 400 Hz, − 27.5 dBs to Audio Line Input.
2) Connect the audio level meter to the Audio Line Output.
3) Adjust the attenuator so that the audio level meter will indicate − 27.5 dBs.
4) Make recording in the SP mode.
5) Set an audio line input signal to 7 kHz and make recording.
6) Playback a recorded portion, and measure output levels at 400 Hz and 7 kHz.
7) Confirm that the 7 kHz playback output levels within a range of the 400 Hz playback output level 0 ± 1 dB. When it is out of this range, sdjust RV301 and repeat the steps 1) through 7) above.

2-5. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENTS

RV-33 BOARD (COMPONENT SIDE)


RV003
PB LEVEL
RV005, 006
CARRIER DEVIATION
RV001
Sync. agc
IC001
RV004
WHITE CLIP
RV009
REC CHROMA
T001
VCO

MA-200 BORD (CONDUCTOR SIDE)


CN802
1
20
IC601
15 1
16 30
CT601
VCO FREQUENCY
CN801
1
14
IC121
SW 12V
D121
MTR 12V
D502 (CATHODE)
D5V
Q123 (EMITTER)
SW 5V
C187⊕
DC 40V
CNJ001
LINE IN/OUT
RV502
SWITCHING POSITION
RV301
RECORDING BIAS